

CASSELL'S
ENCYCLOPÆDIA
OF GENERAL INFORMATION

WITH COLOURED PLATES AND MAPS
AND NUMEROUS FULL-PAGE ENGRAVINGS

RUNRIG—STADIUM

SPECIAL EDITION

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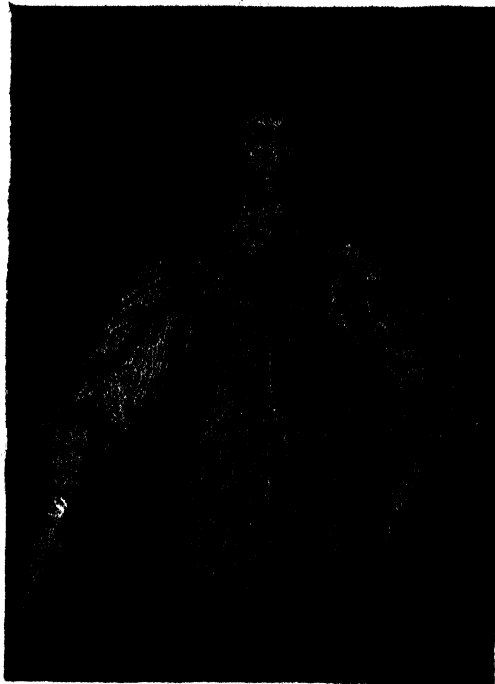
CASELL'S ENCYCLOPÆDIA OF GENERAL INFORMATION.

Runrig Lands, lands held in Scotland and Ireland on the runrig system, according to which the alternate rigs, or ridges, of a field belonged to different owners. The proprietary rights being absolute and not common, it is obvious that this form of husbandry offered a formidable obstacle to agricultural development. Consequently in 1695 statutory power was given to the judge in ordinary, or the justices of the peace, to divide all such holdings of larger area than four acres "according to their respective interests." The occupancy of such lands on such terms bespeaks either an early stage of civilisation or a poor condition of soil, or cultivators, or both.

Rupee, a silver coin of India, containing 16 annas (or pence), and varying from 2s. to 1s. 3d. in value. The closing of the Indian mints in 1893 made it a token coin of the nominal value of 1s. 4d. sterling. By an Act of 1898 the sovereign was made legal tender and equivalent to 15 rupees. It will be useful to state that 100,000 rupees equal a lac, and 10,000,000 a crore. The rupee was first coined in the middle of the 16th century.

Rupert, PRINCE, general, third son of Elizabeth, Queen of Bohemia, and of Frederick V., Elector-Palatine of Bavaria, was born at Prague on December 17th, 1619. Of his education little is known, but he visited England in 1636, and was well received by his uncle Charles I. After his return to the Continent he was imprisoned at Linz for three years, and went to England in 1642 to command the cavalry of Charles I. during the Civil War. His great but somewhat ferocious valour was conspicuous at Edgehill and Chalgrove, where Hampden was fatally wounded, but he was repulsed at Caversham Bridge in an attempt to relieve Reading (1643). On January 24th, 1644, he was created Earl of Holderness and Duke of Cumberland and entrusted with an independent command. He had previously taken Bristol (July 26th, 1643), but was completely beaten at Marston Moor (July 2nd, 1644) by Oliver Cromwell, a disaster that involved the surrender of York, greatly to the chagrin of Charles. After the defeat at Naseby

(June 14th, 1645), he provoked the King by recommending negotiations for peace, and when he surrendered Bristol was dismissed the



PRINCE RUPERT.
(From the painting by Van Dyck.)

Royal service, though a reconciliation was effected before he left for France. After seeing warfare at Landrécy, La Basse and elsewhere, he took to buccaneering off the Peninsula, in the Mediterranean and the West Indies, but, after the Restoration, won naval distinction in the war against the Dutch. The last years of his life were mainly occupied with scientific research, and, among other things, he invented Rupert's drops and Prince's metal, a mixture of copper and zinc, in which the proportion of

zinc is greater than in brass, but he is falsely credited with the invention of mezzotint engraving which was due to the artist Ludwig von Siegen. He helped to establish the Hudson Bay Company, and was its first governor, Rupert Land being named after him. He died in London on November 29th, 1682, and was buried in Westminster Abbey. As a general he was noted for his headlong courage, his cruelty and his addiction to plundering.

Rupert's Drops, said to have been discovered by Prince Rupert, are little drops of melted glass dropped into water. The outside is therefore suddenly cooled and forms a solid skin round the still liquid interior. The interior as it cools tends to contract, but cannot on account of the forces which cause it to adhere to the solid skin. The whole is therefore in a state of strain, and a slight disturbance is sufficient to cause a complete disintegration of the whole. Thus, if the end be broken off or a scratch made on the drop, it falls to powder with almost explosive violence.

Rupia, a form of skin disease, in which blebs appear upon the skin, the contained fluid being at first serous and later purulent. A scab ultimately forms covering a subjacent ulcer; the scab is thick, and in *rupia prominens* it is shaped like a limpet shell. *Rupia* ordinarily occurs in association with the secondary lesions of syphilis. "The rupial lesions," says Malcolm Morris, in his manual on *Diseases of the Skin*, "are hardly ever met with till from six months to a year from the appearance of the primary sore, and then usually only in persons who have neglected treatment or whose health has broken down. *Rupia* always leaves scars and is generally symmetrical."

Rupture. [HERNIA.]

Rurik, founder of the Russian kingdom, in 862 put himself at the head of the Slavs in Novgorod, - and conquered (together with his brothers) the whole of the district from Novgorod to what is now Little Russia. On the death of his brothers he united the country under the name of Russia. He died in 879.

Rush, the popular name for members of the genus *Juncus*, the type of the monocotyledonous order Juncaceæ, extended also to a few related or similar plants. There are about 100 species in the genus, mostly natives of temperate and arctic regions, 20 being British. They grow mostly in wet ground or in water, with cylindric leaves and branches and green or brown flowers in a dense cluster known as an anthela. The flowers have six glumaceous perianth-leaves and six stamens, and are succeeded by a three-chambered, many-seeded capsule. *J. conglomeratus*, *J. acutus*, and others are used for chair-bottoms, baskets, hassocks, and mats, several hundred tons being imported annually into England, mostly from Holland. The stellate parenchyma or so-called "pith" in the centre of the branches and leaves of some

species used to be employed as candle-wicks, and in still earlier times stone floors were strewn with rushes in lieu of carpets.

Rush, BENJAMIN, physician, was born in Byberry, Pennsylvania, on December 24th, 1745. After graduating at Princeton College, he studied medicine at Philadelphia, under Dr. John Redman, and then proceeded to Europe, where, especially at Edinburgh and Paris, he completed his education. Settling in Philadelphia in 1769, he was speedily appointed to the chair of chemistry in the Medical College of the city and became otherwise celebrated for his support of the Revolution. He was elected to Congress and signed the Declaration of Independence. After the outbreak of hostilities he tended the wounded and dying on many battlefields, but was constrained to withdraw from further military duty in consequence of what he deemed injury to the soldiers through misappropriation of the hospital stores. Accordingly he resumed his practice in Philadelphia, to the responsibilities of which he added the professional tasks of the chairs of chemistry, the theory and practice of medicine, the institutes and practice of medicine and clinical practice, in addition to acting as surgeon to Pennsylvania Hospital and port physician to Philadelphia. He was one of the founders of Dickinson College, the Philadelphia Dispensary and the College of Physicians. During the yellow fever visitation of 1793 he played a heroic part, visiting from 100 to 120 patients daily. This did not secure him from a scurrilous attack in William Cobbett's paper, *Peter Porcupine's Gazette*, which cost the libeller \$5,000 damages, which Dr. Rush expended upon the poor. His experiences during the epidemic satisfied him that yellow fever was not contagious, and he was the first to pronounce the disease indigenous. He has been called the Sydenham of the United States, and may, in respect of his accurate observations and correct discrimination of several tropical diseases, be regarded as the pioneer of that branch of medical investigation to which the brilliant researches of Sir Patrick Manson were the fitting climax. Rush belonged to nearly every literary, medical and benevolent society in his own and other countries, and his unwearied labours made Philadelphia the centre of medical science in his native land. He died in Philadelphia on April 19th, 1813.

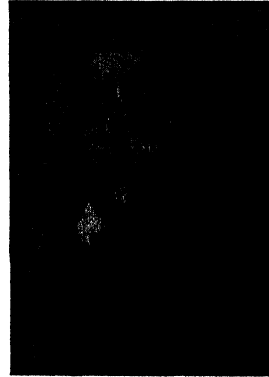
Rushin Castle. [CASTLETOWN.]

Rushworth, JOHN, historian, the "Dryasdust" of Thomas Carlyle, was born about 1612 at Acklington Park, in Warkworth parish, Northumberland, and educated at Oxford. He was called to the bar, but being more deeply interested in politics than law, early began the practice of collecting miscellaneous information about State affairs, especially during the period of eleven years before the summoning of the Long Parliament in November, 1640. On April 25th of this year he was made assistant

clerk to the House of Commons, and seems to have been in the habit, *sub rosa*, of taking notes of the debates. When the New Model Army was organised, he became secretary to the general and the council of war, in which capacity he was present at several battles, writing, for Sir Thomas Fairfax, an account of the military operations for the Speaker. For a few months he was Oliver Cromwell's secretary in the Scottish campaign and prepared a narrative of the battle of Dunbar (1650). In 1657 he was elected member for Berwick-on-Tweed, and represented the borough in several Parliaments. He was consulted by royalist intriguers before the Restoration and received Charles II.'s thanks for delivering up certain volumes of the records of the Privy Council which he claimed to have preserved during the troubles. He had, however, to appear before the Lords in consequence of an allegation that he had been privy to the king's death, but he declared that all he knew was by hearsay. In spite of the lucrative posts he held and his opportunities for enriching himself, he fell into straitened circumstances and spent the last six years of his life in the King's Bench Prison in Southwark, where he died on May 12th, 1690. The eight volumes of *Historical Collections* which are his title to fame were published at different dates between 1659 and 1701. He was accused of partiality by the Cavaliers. So much material in various quarters is now at the historian's disposal that Rushworth's work is not so valuable as it once was, but it must always retain its usefulness, if only for his short-hand notes of the proceedings in Parliament.

Ruskin, JOHN, author, artist, and social reformer, the son of a Scottish merchant, was born in London on February 8th, 1819. He was educated privately and at Christ Church, Oxford, graduating in due course and carrying off the Newdigate prize in 1839. His love of art found expression in his early attempts at painting and in the pamphlet written by him in defence of J. M. W. Turner and his method, which was afterwards expanded into the great work, *Modern Painters*, the five volumes of which, illustrated by himself, appeared between 1843 and 1860 (at first anonymously under the designation of "A Graduate of Oxford"). His views found general favour, and his gorgeous style and poetical diction gained him great applause, but many writers severely criticised his opinions. On April 10th, 1848, he married a beautiful girl, Euphemia Chalmers Gray, some ten years his junior, who, when the marriage had been dissolved about six years later in an undefended nullity suit, became the wife of J. E. Millais the painter. In 1849 appeared his *Seven Lamps of Architecture*, which was followed by the pamphlet on *Pre-Raphaelitism* (1851) in which he called attention to the noble work of Millais and Holman Hunt, *The Stones of Venice* (1851-3), a work illustrated by some of his own drawings, *The Political Economy*

of Art (1857), *Unto this Last* (1862), *Ethics of the Dust and Sesame and Lilies* (1865), *Crown of Wild Olive* (1866), *Fors Clavigera* (1871-84), 96 "Letters to the Workmen and Labourers of Great Britain," *Munera Pulveris* (1872), *Aratra Pentelici* (1872), *Val D'Arno* (1875), and others of equal note. Several of these were reprints of lectures delivered by him with marked success at Oxford and Cambridge. He was Slade Professor of Art at his own university (1870-7 and 1883-4), and Rede Lecturer at Cambridge, of which he was made honorary LL.D. in 1867. His autobiography, under the name of *Præterita*, appeared from 1885 to 1889, and in 1893 his *Poems* were published. He died on January 20th, 1900, at Brantwood, his house on Coniston Lake, in Lancashire (whither he had removed in 1871), having lived in retirement for several years before his death. At one time regarded as the greatest exponent of



JOHN RUSKIN.

(Photo: Barrand & Co., Oxford Street, W.)

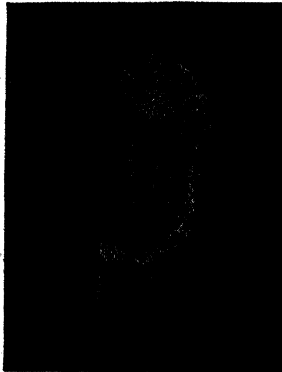
the principles of Art, Ruskin was fated to see his influence materially diminished. His want of sympathy with the new schools led to certain contemptuous allusions to the brilliant "Nocturnes" of J. M. Whistler. In the regrettable lawsuit which followed (1878) Whistler obtained a farthing damages and a public subscription discharged Ruskin's costs. But if Time has come round to the side of Whistler rather than of Ruskin, it is a singular coincidence that the views on political economy which formerly gained for Ruskin nothing but obloquy have now won wide acceptance, and at any rate colour and inspire all dissertations on the dismal science.

Russel, ALEXANDER, journalist, was born in Edinburgh on December 10th, 1814. After attending a local school, he was apprenticed to a printer, but, encouraged by his contributions to *Tait's Magazine* to pursue a literary career, became editor first of the *Berwick Advertiser* (1839) and afterwards (1842) of the *Fife Herald*. His work having impressed the proprietors of *The Scotsman*, he joined that newspaper as assistant editor in 1845 and three years later was appointed editor. Under his care the journal speedily attained the foremost rank and influence, advocating Whig principles and supporting liberalism in religious thought and progress in social affairs. He was a model of industry, intermitting his labours only by occasional trips to the Tay, Tweed, or other

Soots stream, for he was an enthusiastic angler and the writer of an authoritative work, namely, *The Salmon* (1864). He was elected (1875) honorary member of the Reform Club in London, "for distinguished public services," being the tenth recipient of that honour since the opening of the Club in 1836. He died in Edinburgh on July 18th, 1876.

Russell, CHARLES, BARON RUSSELL OF KILLOWEN, Lord Chief Justice of England, was born at Newry,

Ireland, on November 10th, 1832, and was educated at Belfast, Newry, Castleknock and, later, Trinity College, Dublin. He first practised as a solicitor, but was afterwards called to the English bar. He joined the northern circuit, where his knowledge of common law procedure and his searching style of cross-examination soon brought him to the forefront of his profession. In 1881 he was elected M.P. for Dundalk as a Liberal Home Ruler, and in 1885 was returned for South Hackney, becoming Attorney-General (with a knighthood) in W. E. Gladstone's ministry of 1886 (and again in 1892). During the sittings of the Parnell Commission (1888-9) he achieved the forensic triumphs of his career, not only in his dramatic cross-examination of Richard Pigott, the forger of the alleged Parnell letters, which created a profound sensation and broke down the major case, but also in the speech for the defence which occupied six days and was the greatest effort of his life. For his services on the Bering Sea Commission (1893) he received the Grand Cross of St. Michael and St. George. In May of the following year he was made a Lord of Appeal and raised to the peerage, and in June of the same year succeeded Lord Coleridge as Lord Chief Justice. Somewhat to the surprise, but wholly to the delight of the bar—which had entertained doubts whether so strenuous an advocate would make a good judge—he turned out an ideal "Chief." He was keenly interested in the endeavour to suppress the corruption and bribery that were fast undermining commercial transactions and did his best to promote the necessary legislation to this end. In 1899 he acted as one of the arbitrators to determine the boundaries of British Guiana and Venezuela. He died in London on August 10th, 1900.



LORD RUSSELL OF KILLOWEN.
(Photo: London Stereoscopic Co.)

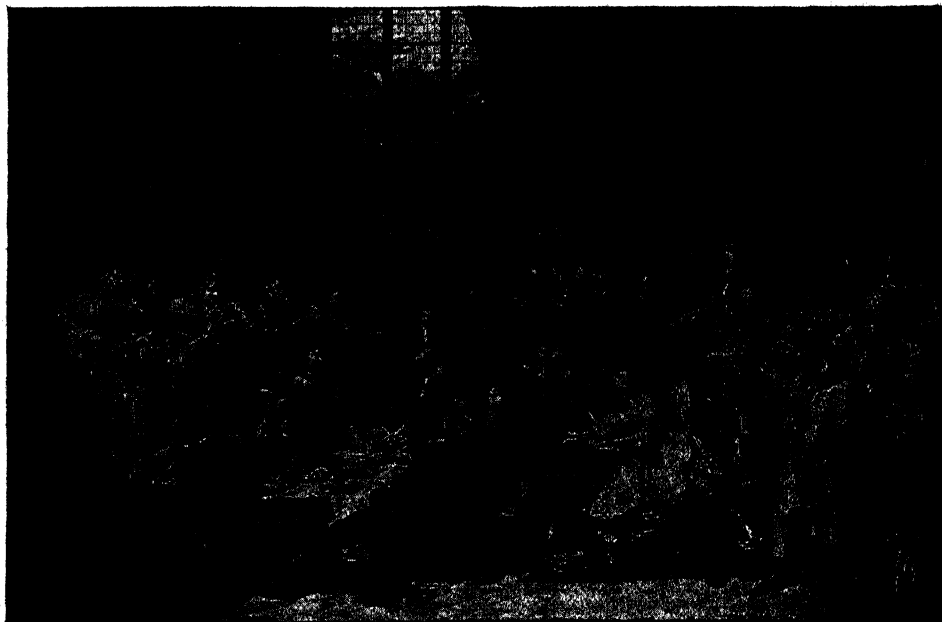
Russell, HENRY, vocalist and song-writer, was born at Sheerness, Kent, England, on December 24th, 1812. He soon showed a bent for music, and, after appearing as a tenor at the Surrey Theatre, London (1828), went to Italy, where he studied at Bologna and (under Rossini) at Naples. On his return to England he acted for a time as chorus-master at His Majesty's Theatre. He next migrated to Canada and from 1833 to 1844 was engaged in a "one-man" entertainment in the Dominion and the United States, during which he sang, with remarkable success, his well-known songs, such as "Cheer, boys, cheer," "There's a good time coming, boys," "A Life on the Ocean Wave," "O woodman, spare that tree," "To the West, to the West," and many others. When he returned to the mother country he repeated his concerts with marked appreciation and, along with Dr. Charles Mackay—who had written the words of his most admired songs—sustained for a long time an entertainment called "The Far West, or the Emigrant's Progress from the Old World to the New," which was said to have had a decided effect in stimulating emigration to Canada and the United States. Russell retired about 1865, but reached a ripe age, dying in London on December 8th, 1900. He was present at the "Henry Russell night" organised by Sir Augustus Harris at Covent Garden Theatre in 1891, and, in 1895, published a volume of reminiscences under the title of *Cheer, boys, cheer*.

Russell, LORD JOHN, first EARL RUSSELL, statesman, was the youngest son of the sixth Duke of Bedford, and was born in Westminster on August 18th, 1792. His schooling was interfered with by his delicate constitution, but he was educated for a time at Westminster School, and afterwards at Edinburgh University (1809-12). In 1813 he entered Parliament as M.P. for Tavistock, becoming member for Huntingdon in 1820. He was an ardent Liberal, and for many years pressed forward various schemes of reform, which were invariably rejected. He published, in 1819, a *Life of William, Lord Russell*, in 1822 his tragedy of *Don Carlos*, and in 1827 a translation of the fifth book of the *Odyssey*. He first obtained office in 1830 as Paymaster of the Forces. The Reform Bill of 1832 was largely the result of his persistent advocacy, and in 1834 he was offered the leadership of the Commons, but, in consequence of the king's personal hostility to him, the proposal was abandoned. In 1835 he became M.P. for Stroud, and in 1841 was elected to represent the City of London. He was appointed Home Secretary soon after his election for Stroud, and between 1839 and 1841 was Colonial Secretary. It was owing to the expression of his opinion, in his speech on the Address in 1837, that he could take no further part in schemes of electoral reform, that he was nick-named "Finality John." He aided in the repeal of the Corn Laws, and in 1846 attained the office of Prime Minister, which he held till 1852.

The principal measures passed during his premiership were the Ten Hours Bill, the Enfranchisement Act, the Repeal of the Navigation Acts, the Act establishing the Poor Law Board (afterwards merged in the Local Government Board), and the Australian Colonies Act, in terms of which the Colony of Victoria was created and New South Wales invested with representative government. Lord John took up a pugnacious attitude on the question of Papal aggression (1850-1), his No Popery declarations evoking the enthusiasm of the Protestants and the disgust of High Churchmen and Catholics. He was Foreign Secretary for a few weeks in 1852, and retired in 1855 from Lord Aberdeen's cabinet before Roebuck's resolution impeaching the Crimean policy came on for discussion. In 1856 he was plenipotentiary at the Vienna Congress, and again Colonial Secretary, a post which he soon resigned for reasons of State. In 1861 he was raised to the peerage, in 1862 was created K.G., and in 1865, after the death of Palmerston, he was again Premier, but only for a year. His public work was done, and he died at Pembroke

the opposition of the peers to Parliamentary Reform, his contemptuous protest, "It is impossible that the whisper of a faction should prevail against the voice of a nation," weakened the hostility of the Lords. His scathing retort to Sir Francis Burdett was one of the finest ever offered in Parliament: "The honourable member talks of the cant of patriotism; but there is something worse than the cant of patriotism, and that is the re-cant of patriotism." Queen Victoria having inquired, "Is it true, Lord John, that you hold that a subject is justified, in certain circumstances, in disobeying his sovereign?" his reply was tactful yet telling, "Well, speaking to a sovereign of the House of Hanover, I can only say that I suppose it is." His definition of a proverb was perfect, "One man's wit and all men's wisdom."

Russell, WILLIAM, LORD RUSSELL, patriot, son of the first Duke of Bedford, was born on September 29th, 1639, and was educated privately and at Cambridge University (the College being unknown). After the Restoration he was elected M.P. for Tavistock, and in 1669



TRIAL OF LORD WILLIAM RUSSELL, 1683.
(After the painting by Sir George Hayter.)

Lodge, Richmond Park, on May 28th, 1878. He was an adept phrase-maker. In his *Memoirs of the Affairs of Europe* (1824) occurs the famous poser, "When I am asked if such or such a nation is fit to be free, I ask in return, is any man fit to be a despot?" Referring to

married Rachel Wriothesley (1636-1723). This noble woman, whose beautiful character is clearly reflected in her *Letters*, was the widow of Lord Vaughan and second daughter of Thomas Wriothesley, fourth Earl of Southampton. Their marriage was one of unbroken affec-

tion. Russell had been a member of Charles II.'s Privy Council, and resigned owing to the recall of the Duke of York and what he conceived to be the consequent probable re-establishment of Popery. He brought the matter before the House of Commons, and its action induced the king to dissolve it and to act arbitrarily in other ways. In 1678 Russell had succeeded to the courtesy title of Lord Russell on the death of his elder brother Francis, heir to the earldom, and the enhanced importance of his position caused him to be viewed with greater suspicion by the king's party. Under cover of the Popish Plot agitation the Opposition renewed their attacks on the Duke of York, and Lord Russell was probably involved in a secondary sense. His support of the Exclusion Bill filled up the measure of his iniquity; he was tried for complicity in the Rye House Plot to assassinate the king, and was beheaded in Lincoln's Inn Fields, London, on July 21st, 1683. His courage and intense love of liberty endeared him to the people. After the Revolution the attainder against him was annulled, and in 1694 his father was created duke, the preamble of the patent describing him as father to Russell, "the ornament of his age."

Russell, WILLIAM CLARK, novelist, son of Henry Russell, the singer, was born in New York on February 24th, 1844, and educated at a private school in Winchester and at Boulogne. From the age of 13 till he was 21 he was employed in the mercantile marine, during which he went through a variety of experiences that bore fruit in several of his books. His earliest novels, *John Holdsworth*, *Chief Mate* (1874), *The Wreck of the "Grosvenor"* (1875), *A Sailor's Sweetheart* (1877), *The Frozen Pirate* (1877), *An Ocean Free Lance* (1878), were all stirring stories of the sea, and had an immense vogue. They were followed by others of higher literary qualities and no less interest, such as *List, ye Landsmen!* (1897), *The Romance of a Midshipman* (1898), *The Ship's Adventure* (1899), *Overdue* (1903), *Abandoned* (1904), *Wrong Side Out* (1904), *The Yarn of Old Harbour Town* (1905), and many more. He has also written several acceptable biographies of great seamen, including Nelson, Lord Collingwood, and Dampier.

Russell, SIR WILLIAM HOWARD, journalist, was born at Lilyvale, near Tallaght, Dublin county, Ireland, on March 28th, 1820, and was educated at Trinity College, Dublin. He was called to the bar in 1852, but his strong penchant for journalism was more than satisfied when he was despatched to the Crimea as special correspondent of *The Times*. He was present at all the battles, and his exposure of the mismanagement at the front had more to do with the downfall of Lord Aberdeen's government than Roebuck's resolution. His *Letters from the Crimea*, when published in volume form, long retained their popularity.

His next striking commission for the same paper was in connection with the Indian Mutiny, during which he saw the siege and capture of Lucknow, his correspondence afterwards reappearing in *My Diary in India*. In 1860 he founded the *Army and Navy Gazette*, the purport of which is evident from its title, and of which he undertook the editorship. His duties in this capacity were temporarily transferred to enable him to witness part of the campaigns of the Civil War in the United States, of which he gave an account in his *My Diary—North and South*, 1862. He was present at the battle of Königgrätz in the Austro-Prussian War of 1866, and at the terrible conflicts at Wörth and Sedan, and the Capitulation of Paris in the Franco-German War of 1870-1. He has described many events of more pacific character, such as the marriage and the Egyptian and Indian tours of the Prince of Wales (afterwards Edward VII.). As the first of a long line of brilliant war correspondents he was knighted in 1895, and in 1902 became Commander of the Victorian Order. He died in London on February 10th, 1907.

Russia. Physical Aspects. The vast extent of the Russian Empire is a favourite theme of the geographer. The British Empire alone, in modern or ancient times, has outmatched its prodigious bulk. Stretching across the north of Europe and Asia—from the Baltic and the borders of Sweden, Prussia, Austria, and Roumania in the west to Bering Strait and the Seas of Okhotsk and Japan in the east—and from the Arctic Ocean to the Black Sea, Asiatic Turkey, Persia, Afghanistan, Eastern Turkestan, and China in the south, it has an area (8,660,000 square miles) equal, as Nicholas II. once boasted, to one-sixth part of the land-surface of the globe. Its physical characteristics are in proportion, with two important exceptions. In the first place, it has few mountains, and these only on its borderlands—in the Caucasus and in Central and Eastern Asia. In deference to custom we treat Asiatic Russia separately [SIBERIA], but Nature makes no such distinction. The Urals, a line of low rounded ridges, the highest summits of which are only 5,526 feet above the level of the sea, and through which a railway is easily carried, do not constitute a natural frontier, and in no way interrupt the fauna and flora of the vast plains which roll eastwards and westwards from them. In the second place, European Russia has, in proportion to her bulk, a very small coast-line, and even of this little all the northern parts are ice-bound for the greater part of the year. Even the northern Black Sea ports are frozen in winter, and in the Baltic, Libau alone is almost always open. [PETERSBURG, RIGA, ODESSA; WHITE SEA, BALTIC, BLACK SEA, CASPIAN.] Lacking mountains and valleys, coast-line, and a Gulf Stream, Russia is deprived of most of the climatic influences as well as the scenic effects which the smaller countries of Europe enjoy. Apart from the regular sea-

sonal changes, there is a likeness of condition in her various latitudes—from the land of the reindeer to that of the camel—which gives some ground for the declaration that Russia was "created for unity." Almost everywhere the extremes of heat in summer and cold in winter are experienced. The west and south winds avail little against those of the icy north and the arid east; and their burden of moisture is soon lost. There is but a small rainfall. Only in the Southern Crimea and beneath the towering bulwark of the Caucasus is there a southern climate as northern readers understand the term. The sudden break-up of the long winter frost in a short raw unpleasant spring has given native poets one of their best subjects. Hardly less striking is the sudden lapse into the idle indoor life of winter, with doors and windows hermetically sealed and the great stove ever hot; or the sleighing, the sport, the skates, and the ice-hills.

Setting apart the moss-covered deserts or tundras of the far north, where the few half-savage hunters and fishermen [SAMOYEDS] maintain a precarious existence, two natural regions differentiate themselves amid the general uniformity of the landscape, giving a key to racial differences and the historical developments we have presently to trace. The northern and slightly larger zone, that of the forests and lakes, extends from the 65th southwards to the 53rd degree of latitude—say, from Archangel to Kieff. Immense forests, mainly of birch, pine, larch, and fir, spring out of the boggy and occasionally sandy and always comparatively sterile plain. The overplus of water gathers itself into broad marshes, rivers, and lakes varying in size from the eleven hundred of Archangel to Ladoga and Onega, the largest in Europe. Here is the only noticeable elevation of the central plateau, the Valdai Hills, where the Volga and other great southern rivers rise. [DWINA, WESTERN and NORTHERN.] Throughout this region agriculture is pursued among most unpromising conditions, and only in the few industrial centres, especially about Moscow and the mines of the Ural, is there any concentration of population or growth of prosperity. The second zone, that of the Steppes, occupies the southern half of the country, broadening as it sweeps eastwards into the still drearier plains of Asia. Through its interminable prairies the great rivers pursue their unbroken and unlovely course, carrying the needed wood and water of the north in exchange for the grain of the south. [VOLGA, DNEPER, DNIESTER, DON, URAL.] The network of canals which joins

many of the Russian rivers completes the list of the magnificent waterways which are her great compensation for her isolated position and climatic disadvantages. Over the upper part of this zone, treeless as it is, in the north by man's extravagant folly and in the south by nature's parsimony, there lies a rich soil, the famous *chernoziom* or black mould, which makes it pre-eminently the granary of Europe. In the south this rich belt merges first into the



SKETCH MAP OF RUSSIA IN EUROPE.

fertile steppe, a virgin prairie covering another three or four hundred thousand square miles in the Cossack country and along the lower course of the great rivers, and then into the barren sandy or saline wastes of the Uralo-Caspian depression.

Considering its vast area, the flora of Russia is comparatively poor. The fauna includes the wolf, bear, gibbon, and fox, but reptiles are rare, and the sable is nearly extinct. The rivers are abundantly stocked with fishes and whales, seals, and bears are common in the

Arctic waters. Great as is the mineral wealth it will be of vastly more importance when exploited with adequate labour and capital. Besides iron, coal, and naphtha, there occur, in more or less considerable quantities, gold, silver, platinum, copper, lead, manganese, mercury, zinc, sulphur, cobalt, and salt. The diamond, emerald, and topaz are found in the Urals. Though still in a backward state, agriculture employs the major part of the population. Rye, wheat, oats, barley, potatoes, and hay are very generally cultivated. Grapes, tea, cotton, tobacco, rice, hemp, and flax are also raised in considerable quantities. In certain districts cattle and fine breeds of horses are diligently reared. The staple manufactures are the various textiles, metal wares, soap, tobacco, liquors; beet-sugars, candles, paper, glass, pottery and porcelain, jewellery, arms and leather. The famous fairs are the most conspicuous of the distributing centres, but the canals, rivers, Trans-Siberian, Transcaspian, and the great trunk railways in Europe have practically rendered obsolete the former system of carriage by caravan. It was by this means that the tea, the finest the world produces, was brought from China to the West.

History. The making of the Russian State began, no doubt, in the belligerent impulses which brought Scandinavian freebooters down upon all Europe about the same time (Finnish, *Ruotsi*; *Rothsmenn* or *rothskarler* = "rovers," "seafarers"). It proceeded afterwards from the natural exigencies of the situation. A glance at the ethnographical map of Russia in the 9th century shows that of the three main racial groups [SLAV RACE, FINNO-TATAR, TURKI], the barbarians of Turanian stock occupied by far the greater part of the country. Across the whole north were the Finnish tribes; in the east, the centre, and nearly the whole of the south Finns and Turks mixed; and south-east of the Volga and the Urals more Turks, especially Bashkirs and Khazars. The last-named, the most powerful and most civilised of these peoples, then masters of the Steppes, though troublesome themselves, proved to be the best rampart against the mountaineers and Greeks of the south, and at a later time against the Tatars (the correct form of the more familiar Tartar which, though erroneous, is probably too well established ever to be dislodged), Mongols, Kirghiz, and Kalmuks of the east. On the other hand, the Slavs spread down the west-centre from Novgorod to Kieff and the mouth of the Dnieper, and westwards thence into Poland and Pomerania, having Lithuanians as neighbours on the middle Baltic coast. These peaceful Slavs of the north-west already had some cities, notably Novgorod, Kieff, and Pskof, the first-named even then an important commercial centre, but were otherwise living in a simple agrarian communism. Either as mere robbers or invaders, or, if we follow the oldest Russ tradition, by invitation to protect the native Slavs from the outer barbarian and to settle their internal differences (very much

as Hengist and Horsa came to Britain), there came to Novgorod in 862 Rurik and several other Varangian adventurers, into whose commissions he soon entered. The monarchy Rurik founded had at first a minimum of organisation and authority, but Oleg, the guardian of his son, was strong enough to capture Kieff, to reduce all the Slav tribes to the mouth of the Dnieper, and even successfully to assault Byzantium itself. The Greeks had their revenge for this indignity. Olga, the militant widow of Igor and the first of many striking female figures in Russian history, went to Constantinople in 955, and was there baptised as a Christian. Two generations later Vladimir, after deliberately examining Islamism, Judaism, and the Latin and Greek forms of Christianity, chose to adopt the last. Thus, without difficulty or disturbance, Byzantinism, with everything that it implied—alphabet, ideas of civil government, all the main features of Greek civilisation—was accepted by the Eastern, as Romanism had already been accepted by the Western, Slavs, a division which was to be the cause of endless strife in succeeding centuries. By his marriage with the sister of the Byzantine emperor, Vladimir sealed this destiny, at the same time making himself a more powerful and more imposing figure. His son Yaroslav, "The Wise," achieved various peaceful works, of which the first Russian code of law was the most important.

The Scandinavian adventurers, having accomplished their pioneering work, having founded a military state upon the important commercial line from the Baltic to the Black Sea and the Bosphorus, were quickly lost in the all-absorbing Slavic environment. A period of active colonisation was now opening, and the danger was that unity would go with the simple military rule they had established. Under the system of multiple-heritage there grew up during the two centuries after the death of Yaroslav (1054) over sixty great and little principalities or appanages, which had in that time nearly three hundred sovereigns. In this period the old primary liberties and privileges were generally maintained, the principalities being really free republics, the princes soldiers of fortune, easily attracted and easily removed, interfering but little with the power in local affairs of the *mir* (village community) and *vetché* (council). Slavery existed, however, and the class of *boyars* (nobles of the highest order) was becoming an important social unit with which both prince and people must reckon. For a time the elder princes, the *grand-kniazes* of the line of Vladimir and Yaroslav, kept their moral superiority, in consequence of their special ecclesiastical sanctions, their foreign relationships, and the close connection between their grand capital, Kieff, and Byzantium, some of whose fading glory she temporarily caught; but this supremacy did not last. Colonisation proceeded steadily on the north and east. On this harder soil, with more mixed racial

elements—half-Slav, half-Finnish—the princes had a freer scope. Feuds multiplied, and the next generations saw much bloodshed, the princes fighting for their own hands here much as the feudal barons in the West. Gradually the elder-brotherly authority was thrown off. In the middle of the 12th century a prince of Suzdal took the title of Grand-Kniaz, and then proceeded to attack and pillage Kieff, which forthwith lost its old supremacy. In 1224, four years after the foundation of Nizhni (or Lower) Novgorod, there came upon the scene a new force which was to turn with violent hand the whole destiny of the country.

There were really three contemporary invasions, not one only; but two of these we can barely mention. On the north-west the Teutonic Knights and the Sword-bearers, two orders of northern crusaders, in subjecting the heathen tribes of Prussia and Lithuania and the Finns of Livonia and Esthonia to German rule, reducing them at once to Christianity and servitude, impinged seriously upon Polotsk, Novgorod, and Pskof. At a later date a Lithuanian chief, Guedimin (1315-40), was able to stop the Teuton incursions and, by repeated conquests among the chaotic Russian principalities, to lay the foundation of that Lithuanian principality which, afterwards becoming unified with the independently-founded Polish state, ultimately extended from the Baltic to the Black Sea, covering all White and Little Russia and effectively cutting off the Slavs of the forest region from civilised Europe.

But the Mongol-Tatar invasion is the cardinal fact of Russian history. This was the northern edge of that vast crescent-shaped wave of Ottoman frenzy which had swept victoriously round the eastern and southern Mediterranean, and which—while the West Christian barons were plundering the Eastern Empire instead of carrying out the obligations of their Fourth Crusade—was preparing a still fuller revenge for the past aggressions of Roman and Byzantine Emperors. Zinghis Khan, already conqueror of Northern China, Afghanistan, part of India, and Persia, sent an expedition to reduce the tribes around the Caspian. The Tatar forces were attacked (1224) by the combined Russian princes, but after a temporary check were completely victorious. During a thirteen years' respite the Russian princes learned nothing. Then the Tatars reappeared in enormous numbers, swept away the Finnish Bulgars of the Volga, overran Ryazan, Moscow, and Vladimir, burning and massacring everywhere. Kieff was destroyed; Galicia and Volhynia were devastated; Silesia was overrun, and for the moment even Rome and Germany were threatened. The invaders pressed far into the north. Novgorod alone, then at the height of its prosperity, was spared, but had to pay tribute. [ALEXANDER NEVSKOI.] The Khans of the Great Horde, from their new city of Sarai, forced all the southern and eastern princes to offer homage in person and then to pay poll-tax to duly-commissioned agents, the

prince being held directly responsible. Every insubordination was terribly punished. The notable thing, however, is that the subject races were left their social structure, especially their religion, which thus became identified with all patriotic hopes and efforts. The next century is full of squalid evidence of the utter demoralisation of the Russian princes. Moscow, hitherto a mere village, innocent of the old Slavic liberties, customs, and traditions, now began to rise into importance, mainly by providing the ablest, most subservient, and most unscrupulous agents to the Mongol Khans. By this connection and by intermarriage the Muscovite nobility became partly Tatarised, and the Oriental element already introduced through Byzantium was revived and intensified. The use of the knout and the *plet* (or whip of twisted hide) began at this time. The former was only abolished under Nicholas (1845), while the latter survived until more recent years. By securing the removal to Moscow of the religious authority and by getting himself appointed general collector of tribute, Ivan I. (died 1340) managed greatly to strengthen and extend the new state. It was not till after another century, during which there was an outburst against the Mongols under Dimitri Donskoi and another bloody vengeance, that the long tyranny may be considered to have come to an end. In 1478—the interval being filled by constant struggles for the princely succession—Ivan III., the Great, forcibly annexed not only Viatka, Tver, and other principalities, but also Novgorod, which never recovered its unique position as a trade centre. Ivan endeavoured to check disintegrating tendencies by ending the system of divided sovereignties and by increasing the power of the Grand-Kniaz as against the petty princes and boyars. He also defeated the Lithuanians, and, finally turning against the now divided khans, routed them and so threw off the crushing yoke of 240 years. The Mongols were often troublesome afterwards, but they never again threatened the integrity of the empire. The extent of the influence of their cruel domination upon the heretofore mild and generous spirit of the pastoral Slavs is a difficult and delicate question; but its main direction cannot be doubted, and its depth is testified still, after the lapse of more than four centuries, by the survival of their double legacy, a united Russia under an absolute despotism.

We are now to see the rapid growth of the sovereign power and the proportions of the state. The fall of the Eastern Empire opportunely suggested a new set of pretensions to the ambitious Muscovites, pretensions which fell in admirably with the idea of a monarchy supreme in Church and State. Ivan III. had married the niece of the last Greek Emperor, and had assumed the imperial arms, the double eagle. The title of Tsar (Cæsar) was fully adopted by Ivan IV., the Terrible. The extraordinary career of this ruler—recalling now Nero, now Louis XI., and again the English

Henry VIII.—has already been briefly summarised. His unspeakable cruelties, his treachery and superstition, make his name a byword; but it is to be said for him that under his rule the power of the boyars was still further curtailed; the civil code was revised and an ecclesiastical code laid down; the bounds of the empire were extended by conquest especially on the east and south, the Mussulman kingdoms of Kazan and Astrakhan and the native tribes of the Volga and Don being conquered; the colonisation of Siberia began under the Cossack Yermak; English and other foreign traders were welcomed and the arts encouraged in a small way. Ere any further considerable national development could occur, it was necessary to win a place upon the Baltic and the Black Sea, and so to open communications with the west and south. But these ways were blocked, the one by Sweden and Poland and the other by the Turks and the Free Cossacks of the south. Nothing could seem more improbable than any achievement in these directions during the veritable "period of troubles," as the Russian historians call it, which makes up the greater part of the 17th century. The episode of the false Demetrius reminds us of the attempt of Perkin Warbeck on the English crown just a century earlier. The fraud assumed large proportions, however, by reason of the deeper ignorance of the Russian people, the more complete isolation of their communities, and, still more perhaps, the selfish designs of native and foreign princes, and the anxiety, especially at the Polish Court, to bring Russia into the Latin communion. Boris Godunof, regent for Theodor and himself Tsar after the murder of the true Dimitri, is mainly noteworthy as the practical founder of serfdom by his temporary measure, afterwards to become permanent, attaching the too-nomadic peasant to the soil. The Polish invasion was temporarily successful, and for a time the country was overrun by Poles, Swedes, Cossacks, Tatars, and other marauders. The rally under the first Romanoff Tsar, Michael, elected and supported by a national council (*Sobor*) in 1613, shows how persistent was the Russian national feeling and the hold of the Orthodox faith. For a time the influence of the nobles revived, and there was a growth of Western influences. Under Alexis, the precursor of Peter, further progress was made, although the condition of the peasants was so desperate that they were driven into repeated revolts. In this reign the Dnieper Cossacks transferred their allegiance from Poland to Russia, securing by compact, however, their autonomy, and the innovations of the patriarch Nikon, which were regarded as arbitrary, caused the great religious disruption to which the chief Dissenting sects (*raskolniks*) trace their origin.

Peter the Great opened the third, which may be called the European, period of Russian history. With all his faults and savagery, he was probably the man for the hour, and made his country a European state. He gave her a

standing army, a navy on the Baltic, the embryo of a modern administration, a diplomatic service, and a financial organisation. He made canals, encouraged industry, literature, and art. The heart of Russia might remain at Moscow, but henceforth it was to have also a head that looked out westwards from the Neva. On the other hand, Peter increased taxation; his cruelty was Oriental, and serfdom under him became more and more extensive. The Court annals of the next century present an extraordinary succession of foreign adventurers, female rulers, palace plots, exiles, vulgar orgies, crimes of violence, and all manner of baseness. [MENSCHIKOFF.] Anna (1730-40) gave the unhappy country up to her German favourites. A second attempt (counting the charter between the *Sobor* and Michael Romanoff as the first) to obtain a constitution failed at her accession. Under Elizabeth the southern part of Finland was obtained from Sweden by treaty; and in the Seven Years' War Russia came into contact with Prussia under Frederick the Great. Her internal politics this reign is noted for the growing oppressiveness of serfdom. In the milder reign of Peter III. German influences revived; this, his confiscation of Church property, and his severe military discipline, led to his downfall. Catherine II. conquered and annexed the whole Crimea and the seaboard between the Bug and Dniester, Russian fleets now appearing for the first time in the Mediterranean. In the three partitions of Poland [POLAND, SUWAROFF, KOSCIUSZKO], in 1772, 1793, 1795, Russia obtained two-thirds of that country, together with the province of Courland, so that the whole Baltic provinces [COURLAND, PETERSBURG, LIVONIA, ESTHONIA] were now Russian. The pretender Pugachev raised a fierce agrarian insurrection (1773), but the victories of Michelson broke his forces, and with his capture the revolt ended. Catherine, although reactionary at the end of her reign, carried on many of Peter's reforms, and thoroughly established Russia as a European power. To her, however, the Ukraine owes its serfdom, as also very heavy burdens in taxation and in the increase of the arbitrary power of the serf-holders. Paul was eccentric to the point of insanity. He established a severe press censorship, reorganised the secret police, settled the succession on the sovereign's eldest son, was now a *pro*- and then an *anti*-Bonapartist, and was assassinated in 1801. Alexander I. renewed the friendship with Great Britain, joined the third coalition against Napoleon, and—the tempting prospect of a Franco-Russian partition of Europe opened out at Tilsit having faded away—was again compelled to withstand the conqueror of Austria and Prussia. [NAPOLEON.] Two years after the occupation of Moscow the Russians stood with the Allies in Paris. The jealousy of the Allies prevented Alexander from taking the whole of Poland. Meanwhile Georgia and nearly the whole of the Circassian provinces had been incorporated, Finland with the greater part of

Bothnia had been ceded by Sweden in 1809, and Bessarabia taken from Turkey in 1812. The various reactionary measures of Alexander's later years provoked much discontent, which at his death culminated in a third futile effort to obtain a constitution. [DECEMBRISTS.] Nicholas made no pretence of satisfying the demands of reform; but in the rôle of liberator of the faithful in the south he joined the Allies in securing Greek independence, and by further aggression in Turkey got more territory on the east coast of the Black Sea and the left bank of the Danube and became protector of Moldavia and Wallachia. A protectorate was imposed upon Khiva, and the Kirghiz kissed the rod. In Siberia the far eastern seaboard was now reached. In the next reign Turkestan was conquered; Khiva, Khokan, and Samarkand were annexed; and Bokhara became a vassal state.

Thus we see completed the Slavic revenge for the Mongol invasion. The full ethnological significance of these long centuries of colonisation and absorption affords materials for an interesting study in the expanse and consolidation of empire, and the separate articles on the SLAV RACE, FINNISH RACE, MONGOLS, TATAE, COSSACKS, POLAND (*Ethnology*), CAUCASIANS, etc., should be consulted. The Great Russians have become the backbone of the nation, constituting nearly half of the total population of the empire and occupying all the central part of European Russia from the White Sea to a line roughly drawn from Smolensk to the point where the Don most nearly approaches the Volga. Little and White Russians [UKRAINE] to the number of 15 millions share the west-centre with Lithuanians on the Baltic shore to the north and Poles on their west. On the south-east are the Turko-Tatar races—Kalmuks, Bashkirs, and Kirghiz. In Lapland, Finland, and the North Ural region are the Finnish races. Scattered about are colonies of Jews, Germans, Swedes, and Southern Slavs.

The futile insurrection of the Poles in 1830-1 led to the revocation of all their liberties. Nicholas now aided Turkey against the Khedive and Austria against the Magyars, this last action depriving him of the sympathy of Western Europe. The campaign against Turkey, which ended in the Crimean War, brought Russia great loss and bitter disappointment. Nicholas died before it ended. It seemed at first that by timely measures of reform Alexander II., a well-meaning but weak ruler, would restore the shaken confidence of his people. The emancipation of 23 millions of serfs in 1861 is the great measure of the reign and indeed of the century. The land of nearly half the peasantry (the other half, the already "free" Crown peasants, were differently treated) was handed over to the village communities (*mir*), subject to a payment for 49 years of redemption dues of 6 per cent. on the amount of the purchase money. The 1½ millions of domestic serfs simply got their liberty. Unfortunately, Alexander, wanting to satisfy

everybody and fearful of the work into which necessity had driven him, entrusted the scheme to alien and unfriendly hands. Alexander III. abolished the old poll-tax in 1886, and in some places reduced the redemption dues; but the burden of taxes and dues is still excessive, and the condition of the peasantry is generally so wretched that they fall an easy prey to the famines and epidemics of cholera and other diseases which have devastated the country in recent years. Alexander III. died in 1894, and was succeeded by his son, Nicholas II., who, in 1899, startled the world with his famous Peace Conference at The Hague. It was, however, an ominous comment upon a proposal that looked so well on paper that the same year saw the Russification of Finland.

The second Polish insurrection (1863) was mainly responsible for the backward turn of the Tsar-Liberator's policy. For a time the crusade against the Turks (1876-8) [TURKEY, BALKAN PENINSULA, SKOBLEFF] drew attention away from domestic affairs; but the victorious issue brought Russia nothing more than Bessarabia, a part of Armenia, and a fuller conviction of the corruption and incompetence of her administration. From this time dates the active revolutionary movement misnamed Nihilism. In its first period, under the inspiration of Herzen, Bakunin in his rational period, and Tchernishevski, it took the form of a secret propaganda with the object of securing freedom of speech and press, public justice, personal security, the abolition of administrative exile, and the calling of a national assembly. In 1878 the propagandists were driven into a terrorist policy, which culminated in the assassination of Alexander II. in 1881. The vengeance of the Government was swift and terrible. Thousands of persons were arrested and imprisoned or exiled without trial. The struggle continued for some time, and then the revolutionary parties subsided again into a policy of propaganda and preparation. Some of their leaders, notably Sergius Stepniak, Felix Volkhovsky, and Prince Peter Krapotkin, having escaped from prison or exile, endeavoured by a foreign propaganda to sap the external sources of the autocracy; and quite a literature is now devoted to the shocking condition of Russian prisons, the brutal treatment of the prisoners, the corruption of the administration, the persecutions of Jews and Stundists, the horrors of Siberian exile, and the absence of all public and private liberty.

In 1904 the long-expected collision between Russia and Japan in the Far East took place, and war was declared. Japan gained a decided advantage in the initial stages, and quickly asserted her supremacy at sea. In the land campaign which followed the Russians were forced to evacuate Korea and Southern Manchuria, and were driven back to Mukden, suffering severe defeats, while Port Arthur was besieged and isolated. The internal conditions of Russia showed great signs of unrest, and

the state of the country and the Government was critical in 1904. Port Arthur, after a prolonged resistance, capitulated, and a crushing blow was administered by the destruction of the Baltic Fleet (1905), which had been despatched to turn the tide of the war. In the same year, at the invitation of President Roosevelt, plenipotentiaries were appointed to discuss terms of peace, and met in August, when, after considerable negotiations, a peaceable arrangement was reached and the war ended. The internal condition of Russia remained in as unsatisfactory a state as before, tempered now with Jew-baiting and now with conflicts between the military and the people. The wanton massacre of the strikers who had marched to the Winter Palace on January 22nd, 1905, peacefully to present a memorial of their grievances to the Tsar, profoundly affected the opinion of foreign countries. Reprisals followed, and amongst the victims of the assassin was the Grand Duke Sergius (February 17th). Repression having failed, conciliation was tried, and on May 10th, 1906, the Tsar opened the Duma, or Parliament, in the Taurida Palace, St. Petersburg. Those who suspected the good faith of the Government in sanctioning this measure of liberalism were justified, for in a few months the great Council was arbitrarily disbanded. The second Duma was treated with equal perfidy, being compulsorily dissolved on June 16th, 1907.

Government and Institutions. The Russian Government is a pure autocracy (sometimes miscalled paternal) with a hereditary succession, the emperor being also supreme head of the Orthodox Russian Church. Imperial administration is conducted by several boards, of which the most prominent are the Senate (founded by Peter I. in 1711), which is entrusted with the promulgation of legislative enactments and is the high court of justice for the Empire; the Holy Synod (established by Peter I. in 1721), consisting of the metropolitans of St. Petersburg, Moscow and Kiev, and charged with the control of religious affairs; the Committee of Ministers (reorganised in 1905); and the Council of Ministers, composed of all the ministers and the general directors of the most important administrations. There are ministers of foreign affairs, war, navy, the interior, public instruction, finance, justice, agriculture and lands, ways and communications, commerce and industry, and others—all, however, liable to be shut down at a moment's notice. "Laws" in Russia simply mean decrees of the emperor. Judicial procedure is in a very backward state, and the criminal system is full of anomalies and inhumanities. The bureaucracy is elaborately divided into 40 ranks (*tsin*). The nobles have never as a class had the power which feudalism gave their fellows in the West, and Russia has perhaps lost as much as she has gained by having no political aristocracy. Military service was made obligatory in 1874. The army numbers, on a peace footing, more

than 1,000,000, but it is calculated that over 4½ millions of men could be called to arms. The clergy are black (regular) or white (secular), the parish popes being of the latter class. There are, besides the Orthodox Church [ГРЕЧКА ЦЕРКВА] many religious sects. The Finnish, German, and Swedish Protestants, the Polish and Lithuanian Romanists, the few Uniates of White Russia, and the Tatar, Bashkir, and Kirghiz Mohammedans, enjoy full liberty of worship, but not of preaching or proselytism. Education is far in arrear, being harassed by constant arbitrary interference in the supposed interests of the state. There are universities in Moscow, St. Petersburg, Kiev, Kharkoff, Dorpat, Warsaw, Kazan, Odessa, and Tomsk, and Finland has a university at Helsingfors. There are middle and higher schools in most of the large towns, and in certain cities there are numerous learned and scientific societies. In local self-government curious democratic features are presented. The Empire is divided into governments (or provinces), and these again into districts. Some of the governments combine to form general governments, each under a governor-general. Each province has a council of control. But, in so far as the lands of the peasantry and local administration are concerned, the parish government is vested in the people through cantonal assemblies and communal assemblies (or *mir*). The affairs of districts are administered by assemblies called *zemstvos*, and towns and cities have their own municipal councils.

Literature and the Arts. Apart from the *byliny*, or poetical folk-tales of legendary and historic heroes, the early proverbs and love songs, and a single surviving poem of the 12th century narrating the expedition of Ivor against the Polovtsi, there is little of popular interest in Russian literature till the time of the national revival under Peter I. Then Lomonosof (1711-65), poet, grammarian, and scientist, though a narrow chauvinist and coarse like most of his contemporaries, gave a new impulse to native thought. For a time, however, nothing better than Court poetry resulted. Through the solemn bombast of Derzhavin (1743-1816) and the German romanticism of Zhukovsky (1783-1852), we come to the period of Pushkin and Gogol. In Pushkin the many-sided poetic spirit of the Slav finds free and vigorous utterance. Lermontoff (1814-41) breathed in, during his repeated exiles to the Caucasus, a vaster inspiration, and came more nearly to the height of Byron's achievement. Gogol, turning his back upon romanticism, brought to bear, in *The Revisor* and *Dead Souls*, the scourge of his wit and a scathing satire upon the hollow society about him. Karamzin (1765-1826) is remembered not only as the great modern historian of Russia, but as a literary forerunner of the Slavophil or Panslavist school, of which Aksakoff and Katkoff were the moving spirits. Solovief (1829-79) and Kostomarov are the next great historians. Kriloff's fables are widely known. Bielinsky (1801-46)

proclaimed a return to realism; and Dostoevsky (1822-81), with tragic intensity, and Tourgenieff (1818-83), with more classic art and a soberer philosophy, have worked in the same spirit in fiction as Nekrasof in poetry and Verestchagin, Hay, and Repin in painting, producing many sombre and harrowing pictures as well as some bright ones of the life of their countrymen. Count Leo Tolstoi has pushed even farther the analysis of the human soul, measuring its every weakness by the inexorable standard of an ascetic Christianity. Goncharov pointed out to the Russians in his *Oblomov* one



RUSSIAN PEASANT GIRL IN FESTIVAL ATTIRE.

of their chief weaknesses. Shevchenko (1814-61), the greatest poet of Little Russia, suffered bitterly at the hands of those in authority, as most of the intellectual leaders we have named have done. Schedrin's social satires and the grim realism of the unhappy Gershin must be mentioned, while among other novelists Korolenko, Potapenko, and Maxim Gorki are now well represented in English. Russian music is extremely characteristic and cannot be mistaken for other than itself. If some of the effects of its masters' orchestration are bizarre, it may yet be questioned whether the frantic revelry of a peasants' holiday, the mad tumult of a nation in arms, the wailing agony of pain and sorrow have been more adequately interpreted by the musical genius of other countries.

Rubinstein and Tchaikovsky represent the highest point to which Russian technique and composition have attained. In science Mendeleeff the chemist, Kovalevsky and Metchnikoff the comparative embryologists, Chebysheff the mathematician, Krapotkin the geographer and mathematician, have international reputations, and Paul Vinogradoff has done the work of an expert in clearing up the early history of land-tenures, especially in England. Russian research is thorough and far-reaching.

Population. Having regard to the history of the Empire—its unscrupulous annexations of territory in Europe and the inevitable expanse in Asia—its population has grown enormously. In 1722 it numbered 14,000,000, in 1812 it was 41,000,000, in 1897 it had reached 129,209,297, and in 1904 it was estimated at 143,000,000. In 1897 Russia in Europe with an area of 1,996,743 square miles had a population of 107,446,199; Russia in Asia with an area of 6,220,400 square miles had a population of 19,140,326; Finland had an area of 125,784 square miles and a population of 2,592,864. If to these we add 317,468 square miles occupied by inland waters (Caspian and Azov Seas, etc.), and 29,908 persons distributed in Bokhara and elsewhere and in the navy, we shall obtain grand totals of 8,660,395 square miles and 120,209,297 population.

Rust. Most metals, if exposed to the air, become covered with a superficial coating, consisting of the oxide of the metal. This oxide is commonly known as rust, but is used more frequently in regard to the rust of iron than that of other metals. Iron rust was distinguished in classical times and employed medicinally. Until the overthrow of the phlogiston theory [PHLOGISTON] the chemical nature of rusts was unknown, and they were regarded as the element, the metal being considered a compound of the rust and phlogiston. Although most metals rust if exposed to the atmosphere, it is noticeable and interesting that none do so in perfectly dry air or oxygen, the presence of a small quantity of aqueous vapour being essential. A variety of methods has been introduced for the purpose of preventing rust, such as galvanizing, japanning, coating with oil-paint, and other vehicles, and the preparation associated with the name of Professor F. S. Barff. It is of the greatest importance to arrest the development of rust in metal structures. This precaution will explain why, for example, painters are constantly engaged on the external framework of the Forth Bridge. By a process of analogy the term rust has been applied to the fungous growths which tend to affect some plants, just as an oxide forms on metal exposed to air and moisture. Black and red rust, fungi with dark or red spores, attack the leaves and stems of wheat and other cereals and grasses. One of the most formidable forms in which plant-rust shows itself is the blight which sometimes infects the potato, rotting not only the leaves and stems, but

also the tubers, and calculated, if unchecked, to destroy vast crops and create famine.

Bustchuk, a town of Bulgaria, on the right bank of the Danube, opposite Giurgevo, in Roumania, 139 miles N.W. of Varna. It is the seat of a Bulgarian and an Armenian bishop, and the many mosques, though sparsely attended, are a picturesque feature. The principal buildings include the municipal offices, arsenal, and custom-house. The industries comprise brewing, tanning, dyeing, in addition to manufactures of tobacco, soap, aerated waters, and pottery, and there are, besides, sawmills and brick and tile works. The town is as old as the Romans, who made it one of their fortresses on the Danube. After its sack by the Barbarian hordes who overthrew the Empire, it languished for many centuries and in modern times suffered severely during the battles of the Russians and Turks. Pop. (1900), 32,680.

Ruth, Book of, the eighth book of the Old Testament, following Judges and preceding I. Samuel. In the Hebrew Bible it is one of the five Megilloth, or rolls read in the Synagogue on five particular days in the Jewish ecclesiastical year, Ruth being read at the Feast of Weeks. The majority of commentators are agreed that it was written at a much later period than that with which it deals, that it is almost certainly post-exilic, and that it possibly dates from the 5th century B.C. It has been said that its objects are twofold, namely, to introduce the family from which David was descended, and to illustrate the marriage laws of the Israelites, with special reference to the question of mixed marriages, held in later times to be unlawful. The authorship is unknown, and it may be conjectured whether the book does not owe the high place assigned to it both in Hebrew and Christian estimation to the charm of the sweet and simple idyll which it describes with such artless beauty and pathos.

Ruthenian, the collective name of the so-called Little Russians, a main branch of the Russian Slavs, who form the bulk of the population in Ukraine (South-West Russia), Galicia, and the Carpathians, numbering altogether about 20,000,000. The Ruthenians are quite distinct in physique, mental qualities, and speech from the Great Russians, or Russians proper, and are regarded as a much purer division of the Slav family. They are taller, with more slender figures and more regular features, and more animated, but also less resolute expression, and more poetic temperament. In recent years the Russian Government has made strenuous, but hitherto unsuccessful, efforts to efface all the differences between the two groups, especially by forcibly substituting the Great Russian for the Little Russian dialect in the educational establishments of Ukraine. Austria contains over 3,000,000 Ruthenians, Hungary nearly 400,000, and there is what is

known as a Ruthenian group in the Austrian Reichsrath.

Ruthenium (symbol, Ru; atomic weight, 103.6), a rare metallic element which occurs to a small extent associated with platinum and its allied metals. It is a steel-grey, brittle metal, specific gravity 11.3, which is very infusible and is insoluble in acids. In its chemical characters it closely resembles the other metals of its class, e.g., osmium, platinum. Osann gave this name in 1828 to one of three conjecturally new metals from the Urals. In 1845 Claus proved the existence of one of Osann's new metals and retained his name because there was actually a new metal in the substance which Osann had designated ruthenium oxide, although it was principally composed of other substances, such as silica, zirconia, etc.

Rutherford, SAMUEL, divine, was born in Nisbet, now part of Crailing, Roxburghshire, Scotland, about 1600, and educated at Edinburgh University. In 1627 he was appointed minister of Anwoth, in Kirkcudbright, where he laboured with great zeal and piety. His preaching was impressive, and he became deeply beloved, but his views were not considered sound, and the bishops, in 1636, ordered him to confine himself to Aberdeen, during the king's pleasure. He was restored to his people in 1638 amid their rejoicings, but soon afterwards accepted a professorship of divinity in St. Mary's College, St. Andrews (of which he became Principal in 1647 or 1648). In 1644 he was appointed one of the commissioners of the Church of Scotland to the Westminster Assembly, and remained in London till near the close of 1647. In 1644 he published his *Lex Rex*, an able protest against the theory of the divine right of kings, and also his *Due Right of Presbyteries*, a learned work which John Milton and others attacked. After the Restoration his *Lex Rex* was publicly burnt at the crosses of Edinburgh and St. Andrews, and he was deprived of office and ordered to answer the charge of high treason, but died, in March, 1661, before his trial. His last words were, "Glory, glory dwelleth in Emmanuel's land." The many letters which he had written having been collected, they were published in 1664, and on them his reputation now mainly rests. The chief subject discussed in them is the union of Christ and His people, as illustrated by courtship and marriage, and the language is occasionally coarse if not indelicate.

Rutherglen, locally pronounced "Ruglen," a town of Lanarkshire, Scotland, 3 miles S.E. of Glasgow, of which it is virtually a suburb, the Clyde being crossed by a bridge between the two towns. It is a place of considerable antiquity and was formerly of greater importance than Glasgow, and indeed comprised much of the present area of the latter city within its limits. David I. created it a royal

burgh in 1126. In the old church (replaced in 1794 by the existing structure) Sir John Menteith is alleged to have undertaken (1291) to betray Sir William Wallace to the English. The castle was repeatedly besieged in the reign of Robert Bruce, was burned by the Regent Murray after the battle of Langside (1568) and completely obliterated two centuries later. The Covenanters, before the battles of Drumclog and Bothwell Bridge (1679), here published a "Declaration and Testimony" of their true principles. The town hall is the chief building, and beside the parish church stands the ancient belfry, a square tower with a spire relieved by dormers. The manufactures include chemicals, paper, pottery, in addition to mills, dye-works, factories, tube-works, and ship-building, while collieries are situated in the vicinity, and many of the inhabitants are employed in Glasgow. Pop. (1901), 18,280.

Ruthin, a town of Denbighshire, Wales, on the Clwyd, 7 miles E.S.E. of Denbigh. It is beautifully situated on lofty ground, surrounded by still higher points, commanding fine views of the Vale of Clwyd. Tradition dates the town to the time of Arthur, who is asserted to have beheaded a rival prince on a stone still preserved in the market-place. More authentically, it is as old as the reign of Edward I., who bestowed the castle on the first Lord Grey de Ruthin. Owen Glendower failed to take it in 1400, though he slew great numbers of people in the attempt. After holding out for two months in 1646, it was surrendered to the Roundheads, who almost completely dismantled it, only a few ivy-clad fragments remaining. The old Gothic church of St. Peter (restored in 1885), with a good modern tower, originally belonged to the religious society of Bonhommes, but in 1310 it was made collegiate by John de Grey. The cloisters that once led from the church to the canons' residences have been converted into a house for the warden of Christ's Hospital, a charity founded in 1590 by Gabriel Goodman (1529-1601), Dean of Westminster, a native of the town. He also founded (1595) the Free Grammar School. His nephew, Godfrey Goodman (1583-1656), a native, became Bishop of Gloucester in 1625. Other buildings comprise the town hall, market hall, and county hall. The manufactures include chemicals and aerated waters, but its importance commercially depends upon agriculture. Its charter was derived from Henry VII. Pop. (1901), 2,641.

Ruthven, RAID OF. In 1582 James VI. of Scotland, then 16 years old, was completely under the influence of his favourites, the Duke of Lennox and the Earl of Arran, much to the vexation of the Kirk and the Lords of the Congregation. Accordingly, William Ruthven, the first Earl of Gowrie, Lord Lindsay of the Byres, the Earl of Mar, and the Master of Glamis devised a daring plan to kidnap the king. They invited him to Ruthven Castle, $2\frac{1}{2}$ miles north-west of Perth, on August 22nd,

ostensibly for a hunting-party. The unsuspecting monarch at once went to the castle, only to discover himself practically a prisoner. "Better bairns greet than bearded men," was the expostulation of the Master of Glamis to the weeping lad. It was nine months before the king recovered his liberty. By simulating contentment with his semi-captivity he lulled the vigilance of his keepers and escaped from Falkland Palace to St. Andrews. This audacious plot came to be known as the Raid of Ruthven (pronounced *Rivven*). Though the schemers were apparently pardoned, they were branded as traitors, and Gowrie, becoming implicated in an attempt to seize Stirling Castle, was executed in 1584. Sixteen years later his son was concerned in the affair of the Gowrie Conspiracy, whereupon James's detestation of the very name of Ruthven grew so acute that Parliament ordered the name to be extinguished, and the castle was thenceforward called Huntingtower. It consists of two massive square towers, which were built at different times and, though now united by a lower block of building, were originally fully nine feet apart from each other. The space between the towers from battlement to battlement, at a height of sixty feet from the ground, is called the "Maiden's Leap," because the first Earl of Gowrie's daughter, whose mother nearly surprised her with her lover, cleared the chasm at a bound, eloping on the following morning.

Ruthwell, a village of Dumfriesshire, Scotland, 9 miles E.S.E. of Dumfries, and about 1 mile from the northern shore of the Solway Firth. It is famous for its Cross, a sandstone Runic monument, $17\frac{1}{2}$ feet high, from $8\frac{1}{2}$ to $2\frac{1}{2}$ feet broad, from $\frac{3}{4}$ to $1\frac{1}{2}$ foot thick, and 3 feet across the arms, which were restored in 1823 by the Rev. Dr. Henry Duncan (1774-1846), who was the first to establish savings banks in Scotland (1810). On the front and back faces of the cross are sculptured representations of the Crucifixion, Annunciation, Christ healing the blind, etc., while the sides are adorned with carvings of vines and grotesque animals, the margins containing Runic verses from Caedmon's poem, *The Dream of the Holy Rood*. The cross is believed to have been set up in 680, and was cast down and broken into several pieces in 1642. The fragments were collected with pious care, in 1802, by Dr. Duncan, who re-erected the monument in the manse garden. For greater safety, and especially to minimise the effects of weather, it was placed in a new wing of the parish church in 1887.

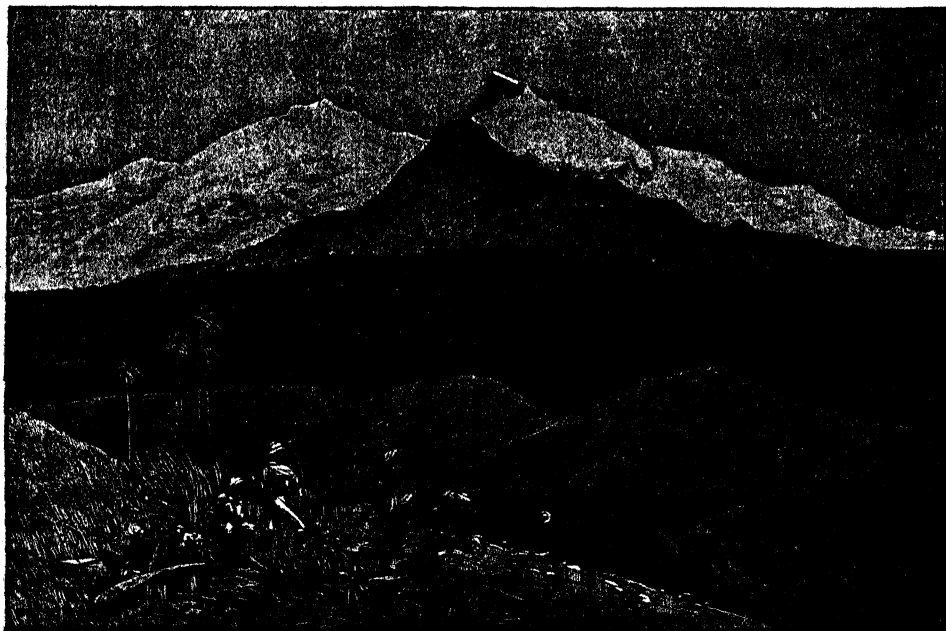
Rutile, a crystalline form of titanium dioxide (TiO_2), a substance remarkable for being trimorphous, i.e., crystallising in three distinct forms—namely, rutile, anatase, and brookite. Of these forms rutile is the commonest, and exists as brown lustrous crystals (often black by reflected and deep red by transmitted light) of the Quadratic system possessing a specific gravity of 4.2. They are occasionally cut for jewels. It frequently occurs in igneous rocks,

e.g., granite, and also in hard limestones. The variety known as sagenite, consisting of needle-like crystals often penetrating transparent quartz, is also popularly styled "Venus' hair stone" and "Love's arrows."

Rutlandshire, or **RUTLAND**, the smallest county in England, bounded on the N.W. and W. by Leicestershire, on the S. and E. by Northamptonshire, and on the N.E. by Lincolnshire. It covers an area of 152 square miles, and measures 17 miles from north to south, and 16 miles from east to west. The chief streams are the Welland, with its

the mansion of Burley, close by, James I. paid a State visit to the Duke of Buckingham, and Charles I. was entertained. There is a well-known public school at Uppingham. The Duke of Rutland derives his title from the county. Pop. (1901), 19,708.

Rütli, or **GRÜTLI**, a meadow on the west shore of the Lake of Uri, the southern arm of the Lake of Lucerne, in the canton of Uri, Switzerland, 7 miles N.W. of Altdorf. It is said traditionally to have been the spot where the patriots, Werner Stauffacher, Arnold of Melchthal, and Walter Fürst, along with thirty



RUWENZORI, OR THE MOUNTAINS OF THE MOON, CENTRAL AFRICA.

(From the sketch by Lieut. Stairs, R.E.)

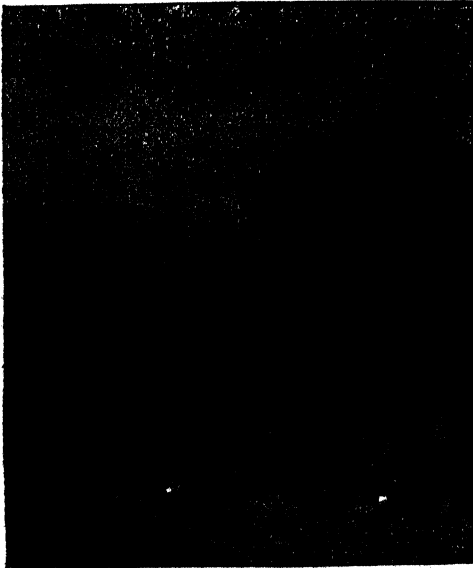
affluents the Chater and Gwash, and the Eye. The soil is extremely fertile, yielding rich crops of barley, wheat, oats, beans and peas, turnips, mangolds, and clover. Many oxen and sheep are raised and dairy-farming flourishes. Limestone is quarried in different localities for use in lime-burning and as a building stone. Malting and boot-making are also carried on, but agriculture is the leading industry. The Roman way of Ermine Street, the great North road, ran through the county, and Casterton was a military station. Afterwards occupied by the Middle Angles, the district in the 9th century formed part of the Saxon kingdom of Mercia. Henry III. made it a shire. Oakham is the county town and at

followers, met on November 7th, 1307, and arranged the plan of campaign which eventuated in freedom from the Austrian yoke and the independence of their country. The place, with a timber-built guard-house in the old Swiss style, belongs to the Confederation, and a block of granite, ten feet high, commemorates the author and composer of the Song of Rütli.

Ruwenzori, or **RUNSORO**, a mountain range of eastern Equatorial Africa, situated between the Equator and 1° N., and intersected by 30° E. The heights of its loftiest peaks are variously estimated at from 16,000 to 20,000 feet, and it presents the largest snowfields in

the continent. On the west its face is abrupt and precipitous; on the east it falls away less steeply to Uganda; to the north it slopes down to the western wall of Albert Nyanza, while to the south it reaches Lake Albert Edward. Bananas and grasses grow up to 5,000 feet; the limit of settlements occurs at 6,700 feet; deciduous trees, bamboos, and heaths are found up to 8,500 feet, and the snow-line is placed at 13,000 feet. Although first seen by Gessi and Mason from Albert Nyanza, it was Sir Henry Morton Stanley who (1888-9) announced the character and extent of the range. Sir Frederick Lugard crossed the northern and eastern slopes in 1891, and Sir Harry H. Johnston (1900) and others have ascended to the snow and glaciers. It was, however, reserved for the Duke of the Abruzzi to climb through the snow to the double peaks. This he successfully accomplished in 1906, when he named the peaks Margherita and Alexandra, after the Queens of Italy and the United Kingdom.

Ruyssdael, JACOB VAN, landscape-painter, of whose life little is known, was born at Haarlem, in Holland, about 1630. He studied medi-



LANDSCAPE WITH WATERFALL.

(By Ruyssdael, in the National Gallery, London.)

cine, but turned to art, and was a pupil of Nicholas Berchem at Amsterdam. He, in turn, was probably the master of Hobbema. His pictures are mostly landscapes, and he excelled in painting wooded scenes and waterfalls, the figures being generally added by other painters. His drawing and composition were admirable,

and the force of his handling is quite modern. He sometimes painted sea-scenes, and his work in this class is worthy of his reputation. He is well represented in the National Gallery, in London. He died at Haarlem in 1682.

Ruyter, MICHAEL ADRIAN DE, admiral, was born at Flushing, Holland, on March 24th, 1607, and entered the navy at an early age. His gallantry and skill gained him a speedy promotion, and he did not fail to take advantage of his opportunities of distinguishing himself against the British on the sea. He commanded with Van Tromp the fleet which, in February, 1653, fought the great engagement with Admiral Blake at the mouth of the English Channel. He was afterwards employed in the Mediterranean, capturing Turkish ships and putting down the Algerine corsairs. In 1666 he repulsed Prince Rupert and Monk, but was himself beaten a little later by them. In the following year he sailed up the Thames to Sheerness, where he destroyed some men-of-war, and in 1672 took part in the drawn battle against the united fleets of Great Britain and France in Southwold or Sole Bay. In a battle with the French off Messina he was wounded, and died at the port of Syracuse of the effects on April 29th, 1676. His body was buried with great pomp in the New Church, Amsterdam.

Ryan, LOCH, an arm of the sea in the north-west of Wigtownshire, Scotland. It runs inland from the mouth of the Firth of Clyde, in a direction almost due south, for a distance of 8½ miles. At the entrance it has a width of 1½ mile, but some two miles from the head is nearly 3 miles wide. Save at the mouth the shores are low, flat, and sandy. It affords excellent anchorage and could accommodate a fleet. White fish, and sometimes herrings, are caught, and the oyster-fishery, once profitable, but neglected, might well be restored. At the head of the loch is the town of Stranraer, from which there is the short sea-passage mail service to Larne, in Ireland. The loch is the Rerigonius Sinus of Ptolemy, and figures in the beautiful old Scots ballad of "Fair Annie of Lochroyan."

Ryazan, a government of Russia, bounded on the N. by Vladimir, on the E. and S. by Tamboff, and on the W. by Tula and Moscow. It occupies an area of 18,260 square miles. The principal river, the Oka, an affluent of the Volga, roughly divides it into two portions, the northern mainly marshy, the southern fertile. The chief crops are wheat, rye, oats, potatoes, tobacco, hops, vegetables and fruit, and livestock is raised on a very large scale, horses being reared in great numbers. Bee-keeping also flourishes in certain districts. The manufactures include cotton, flour, leather, boots, matches, machinery, soap and chemicals, and coal is mined to some extent. Pop. (estimated), 1,830,000.

Ryazan, capital of the preceding province, Russia, on the Trubej, a tributary of the Oka, 110 miles S.E. of Moscow. It is the seat of an archbishop, and has some interesting churches. Other buildings include the museum, library, and several charitable institutions. The chief manufactures are machinery and candles, but in consequence of its situation on a navigable river and the trunk line between Moscow and South-Eastern Russia, it is an important centre for through-traffic. Old Ryazan, 30 miles to the south-east, the capital in the Middle Ages, was repeatedly plundered by the Tatars, who practically achieved its ruin in 1568. Pop. (estimated), 48,000.

Rybinsk, a town and river-port of the government of Yaroslavl, Russia, on the Volga, 55 miles N.W. of Yaroslavl. It is the transshipping point of cargoes from the Lower Volga for St. Petersburg, and of cargoes from the capital and Lake Ladoga for towns on the Lower Volga, and it is therefore one of the most important trading centres in North-Central Russia. It has numerous breweries and flour-mills, but the inhabitants mainly depend upon the traffic of the port. Its normal population of 26,000 is quadrupled during summer, when navigation is at its height, by the influx of labourers from various parts of the empire.

Rydal, a village of Westmoreland, England, 1½ mile N.W. of Ambleside. It is intimately associated with the Lake school of poets, William Wordsworth making his home at Rydal Mount for thirty-six years, and dying there in 1850. In the modern church of St. Mary, in the Gothic style, is a memorial win-



RYDAL MOUNT.

(Photo: G. P. Abraham, Keswick.)

dow to Dr. Arnold, of Rugby (who owned the estate of Fox How, where he spent his holidays), and his wife and Matthew Arnold, the poet and critic, their eldest son. At Nab Scar lived Hartley Coleridge, eldest son of the poet-philosopher. A burn that wimples through a

beautiful little glen near Rydal Hall forms the fine double cascade of Rydal Falls. Rydal Water, one of the smallest but the prettiest of the English lakes, is situated immediately to the south-east of Grasmere. It is not quite one mile long, and its shores are about two miles in circumference. At its western extremity it receives the Rothay from Grasmere and discharges it again at the other end to join in time with the Brathay, the united stream falling into Windermere. In the boughs of the pines which clothe an islet in the middle of the lake is a heronry, and on the north side of the lake is Glen Rothay, near one end of which stood the Wishing Gate rendered famous by Wordsworth. The original gate has disappeared, but its modern representative has long been scored, or disfigured, with the names and initials of tourists.

Ryde, a town on the north-eastern shore of the Isle of Wight, England, 7 miles N.E. of Newport. Being built on high ground, the streets rising in terraces from the sea, it presents a very elegant appearance and is a fashionable watering-place and the headquarters of several yachting clubs. Alongside of the long promenade pier has been constructed a railway pier, by means of which passengers step directly from the trains to the steamers, which ply constantly to Portsmouth, Southsea, Gosport, and elsewhere. The church of All Saints is a fine example, in Early English, of Sir G. Gilbert Scott's workmanship. Other buildings include the town hall and market house in the Classic style, with a square clock tower with open turret, surrounded by Corinthian pillars and surmounted with a cupola; Victoria Rooms; the Royal Victoria Yacht Club-house; the Temperance Hall; the Oddfellows' Hall, and numerous convalescent homes and charitable institutions. The town is almost wholly modern and residential, and is the usual point of contact with the mainland. Pop. (1901), 11,042.

Rye, a town and Cinque Port, Sussex, England, on the Rother, 10 miles N.E. of Hastings. It is a delightfully quaint and old-fashioned place, one of the most picturesque of ancient English towns. It is built over a small hill, crowned with the parish church of St. Mary. Many of the streets are paved with cobbles, and several are still lined with houses of unique charm. Mermaid Street particularly is rich in its out-of-the-world variety of architecture, the Rye Golf Club having acquired the famous Mermaid Inn to secure it from decay. The wealth of subjects has made the town a great favourite with artists. A light railway connects it with the harbour at the mouth of the Rother and also communicates with the golf links, one of the best courses in the south of England. The industries comprise ship-building, chemical works and brewing, and the mackerel and herring fisheries are of considerable importance. As the port for the valley of the Rother, Rye does a large trade in grain, hops, coal, wool,

timber and oak-bark, and, by means of the Royal Military Canal, has access to Romney Marshes. St. Mary's, a handsome old church, contains some fine Norman and Early English work. The clock is traditionally said to have been rescued from a vessel of the Spanish Armada, wrecked on the coast (now, owing to the retreat of the sea, some two miles distant). Above the dial is a shield supported by two gilt cherubs, or "quarter boys," which strike



RYE CHURCH.

(Photo: Chester Vaughan.)

the quarters, and the huge massive pendulum swings majestically in the tower, reminding the onlooker of one of Edgar Allan Poe's most thrilling tales. The Guildhall contains interesting old charters and other documents, some splendid specimens of maces, and the iron gibbet in which the bodies of malefactors were exposed on the adjoining marsh lands. The Ypres Tower, occupying a commanding site on the south front of the hill overlooking the river, dates from the reign of Stephen, and is still in good preservation. The North, or Land Gate, a substantial structure, in excellent condition, marks the former limits of the town, beyond which New Rye has spread to elevated ground on the northern side of the railway. The partially-ruinous, half-sunk Castle of Camber, built by Henry VIII., stands between Rye and Winchelsea. Pop. (1901), 3,900.

Rye (*Secale cereale*), a cereal grass, probably native to South-Eastern Europe, the flour of which forms the black bread which is the staple food of most of Northern Europe. It stands cold better than any other grain, thrives in poor soils, and may be grown continuously in the same ground for long periods. Though less nourishing than wheat, it comes next to it in that respect. It enters largely into kvass, the Russian national drink, into gin in Holland, and into whisky in the United States and Canada. It is still cultivated to a small extent in certain parts of the United Kingdom, but mainly as green fodder, and its grain is also imported for malting. In structure it nearly

approaches wheat, but differs in having two flowers and a stalked rudiment of a third in each of its spikelets. It is peculiarly liable to the attacks of the fungus ergot, which is known in pharmacy as *Secale cornutum*, or "horned rye."

Rye-Grass (*Lolium perenne* and its variety, *L. italicum*), one of the most valuable fodder-grasses cultivated in Great Britain, either in permanent pasture or as a rotation crop. Four crops may be obtained in the year, the first being ready to cut in April, and in sewage-farming the weights of hay which it yields are very great. Its inflorescence consists of a flat compound spike, the spikelets, which overlap, being placed edgewise along the rachis. Each spikelet contains three or more flowers.

Rye House Plot, THE, was formed in 1683, and had for its object the assassination of Charles II. and James, Duke of York, on their return from Newmarket races. Its object was defeated, but its instigator, Colonel Walcot, was executed, as were William, Lord Russell and Algernon Sidney, who were accused of being implicated in the movement of which it was part. Lord Essex escaped the block by suicide. The plot was named from the mansion near Broxbourne, in Hertfordshire, where the conspirators are alleged to have met.

Ryswick, PEACE OF, concluded in 1697 at the town of Ryswick, two miles south-east of The Hague, Holland, ended the war between Louis XIV. and Great Britain, Holland, Spain, and Germany. Louis acknowledged William III. as King of Great Britain and Ireland, restored what he had taken from Germany, with the exception of Alsace and Strasburg, and gave up to Spain his conquests in Catalonia and the Netherlands.

S

S, the 19th letter in the English alphabet, and the last but one in the Phœnician, from which it passed to the Greek. It has a sharp hissing (sibilant) sound, which is sometimes represented by *sh* or *c*, and a soft sound also, represented by *z*. As the teeth and tongue are both employed in its production, it is classed sometimes as a dental, sometimes as a lingual, and is also called a semi-vowel. In German it is generally soft at the beginning of a word, and hard at the middle or end, the English use being, for the most part, the reverse of this. Many Latin words with initial *s* in passing into French acquire the prefix *e*, as *spatium*, *espace*; and the *s* is often dropped entirely, as in *statum*, *état*. Attic Greek preferred *t* to *s*, as, for instance, *thalatta* for *thalassa*, etc., and in many cases the lisping *th* is substituted for *s*. Some South Sea islanders are unable to pronounce *s*.

Saale, or FRÄNKISCHE SAALE, a river of Bavaria, Germany, rising in the Hohe Rhön,

flowing in a tortuous course towards the south-west, and falling into the Main at Gemünden, in Lower Franconia. Its total length is 70 miles.

Saale, or SÄCHSISCHE SAALE, a river of Germany, rising in the Fichtelgebirge, in Bavaria. It pursues a winding, mainly northerly course through Thuringia, Prussian Saxony, and Anhalt, joining the Elbe a few miles above Magdeburg. It has a total length of 250 miles, is navigable to Halle, and canalised to Naumburg.

Saalfeld, a town of Saxe-Meiningen, Germany, on the left bank of the Saale, 23 miles S. of Weimar. It is a brisk old town, having grown up under the protection of the Sorbenburg, a castle built by Charlemagne to defend his territories from the Slavs. The stronghold was destroyed in 1290, but its ruins are still impressive. When the Duchy of Saxe-Saalfeld was founded in 1680 by the youngest son of the Duke of Gotha, Saalfeld became the capital, but when the dukes obtained the succession to the Duchy of Coburg (1735), they transferred their residence to the town of Coburg. The principal buildings are the old palace, the 13th-century church of St. John, and the town-house. The industries include iron-founding, brewing, and the making of machinery and colours. Pop. (1900), 11,680.

Saarbrücken, or SANKT JOHANN-SAARBRÜCKEN, a town of Rhenish Prussia, on the left bank of the Saar, about 40 miles E. by N. of Metz. It communicates by bridge with Sankt Johann on the right bank of the river, the two towns forming one community. The principal buildings are the castle, the mining academy, and the town hall, which is adorned with fine frescoes by Anton von Werner. There is a remarkable statue of Prince Bismarck. The manufactures include textiles, machinery, chemicals, tobacco, leather, hardware, and tapestries, but the great industry is coal, the dual-town standing in the heart of a rich coal-field which gives employment to many thousand miners. In the Franco-German War the French seized Saarbrücken on August 2nd, 1870, but the German victory at Spicheren, 3 miles to the south, four days later, effected its relief. Pop. (1900), 44,499, of which Saarbrücken claimed 23,242.

Saargemünd, a town of Lorraine, Germany, on the left bank of the Saar, at its confluence with the Blies, 10 miles S. by E. of Saarbrücken. The manufactures include silk, velvet, pottery, and snuff-boxes (mostly made of papier-mâché), the last being a speciality of the district. Pop. (1900), 14,680.

Saarlouis, a town of Rhenish Prussia, Germany, on the left bank of the Saar, 31 miles S. by E. of Treves. The fortifications, planned by Vauban, the great military engineer, were completed in 1685. The manufactures include pottery, glass, and leather, and there are coal

mines in the vicinity. Marshal Ney was born at Saarlouis in 1769. Pop. (1900), 7,864.

Sabadell, a town of the province of Catalonia, Spain, 12 miles N.W. of Barcelona. The principal buildings are the town hall, hospitals, and schools. The manufactures include textiles, alcohol, paper, and flour, in addition to iron-founding and saw mills. Pop. (estimated), 23,300.

Sabadilla Seeds are the winged seeds of *Asagraea officinalis*, the only species of a Mexican genus of Colchicaceæ. It is a bulbous plant, with long narrow leaves, an ebracteate raceme of flowers, and a fruit of three many-seeded follicles. The seeds were formerly used to destroy vermin, but are now only used as a source of the poisonous alkaloid veratria, $C_{12}H_{15}N_3O_{11}$. It is principally obtained from Venezuela, most of the shipments going to Hamburg. There is one preparation of this drug in the British Pharmacopœia, an ointment, which is sometimes employed to relieve pain in rheumatism and neuralgia, but great caution should be observed in its use.

Sabbatai Zevi, or SCHATTAI CEWI, the false Messiah, a Turkish Jew, said to be of Spanish extraction, was born at Smyrna, Asia Minor, in 1625 or 1626. In youth he acquired a knowledge of theology and of Arabic, which enabled him to pass for a learned and devout man. He had such powers of persuasion that few could resist him, and when, after an adventurous career in Syria, Italy, Greece, and elsewhere, he joined with an accomplice to personate the Messiah, great numbers fully believed in him. His confederate, named Nathan, acted as a kind of precursor, and the Jews readily fell into the trap, multitudes renouncing their goods and following him, frantic with joy at the coming of the Messiah, as they deemed him. Finally, however, Sabbatai was brought before Mahomet IV., Sultan of Turkey, who forced him by various expedients to confess his imposture, and he became a Mussulman to save his life. Even yet he was not without a considerable following, and the Grand Vizier, to make the assurance of his conversion doubly sure, sent him to solitary confinement at Dulcigno, in Albania, where he died in 1676. His dupes, however, held together for some time, being especially numerous in Adrianople and Salonica.

Sabbath (from a Hebrew word signifying "rest from labour") denotes the seventh day which, in the Mosaic Law, was set apart in commemoration of the finishing of the work of Creation. It was marked by a total-cessation from labour, and had analogies with the seventh month and the seventh (Sabbatical) year. Nehemiah did much to revive its observance, and Rabbinical tradition increased its obligations to an oppressive degree, the Samaritans being more particular than the Jews in respecting its minutiae. It was only gradually that Christians began to transfer some of the sabbatical

obligations to their Sunday, and it was left for the Puritans to declare the Mosaic Law applicable to Christians in a still more strict sense than to the Jews. A stringent Act of Charles II. forbids Sunday trading and labour, works of charity and mercy being excepted. This statute, being still unrepealed, is occasionally enforced against small shopkeepers, but it cannot be said that public opinion has sustained such proceedings, which have always seemed to suggest a straining at the gnat while the camel was comfortably swallowed. The Sabatarians of the present day would forbid almost all recreation and amusement upon Sunday; but many Christian Churches and an increasing number of people in the United Kingdom, while considering that cessation from all but necessary toil is, if not of Divine ordination, yet very desirable, would encourage recreation and amusement. Yet it must not be supposed that the effort to render Sunday more human—the Sabbath being made for man, not man for the Sabbath—has met with much support from the churches. Alarmed at the progress which had already been witnessed in the direction of toleration, and probably also remarking a decline in the habit of “church-going,” a joint appeal was issued at New Year, 1907, signed by the Archbishop of Canterbury, the Roman Catholic Archbishop of Westminster, and the Nonconformist President of the National Council of the Evangelical Free Churches, the purport of which was to discourage Sunday relaxation and to return, *ex hypothesi*, to the observance of a more stringent curriculum.

Sabeans, a religious sect of Mesopotamia about the Lower Euphrates and in the neighbouring Persian valley of the Karun river. They are so named by the Arabs from one of their prophets, but call themselves Mendayaha—i.e., Disciples of John the Baptist, in allusion to their practice of baptism or ablation. Their religion is a mixture of Jewish, Moslem, Christian, and even pagan rites, embodied in the Sidra, a sacred book supposed to be handed down through Seth and Enoch from Adam. It is written in the Chaldean language, a Semitic dialect related to Syriac, with a peculiar character of Phœnician origin, but with a complete vowel system attached to the consonants, as in Ethiopic. Formerly very numerous, especially in the Basra district, they were reduced to a few thousands in Mesopotamia and some scattered communities in Persia. Their headquarters are situated at Suk-esh-Shiok, in the territory of the Montefik Arabs, 224 miles south-west of Baghdad.

Sabellianism, a form of heresy in the early Christian Church, held by the followers of Sabellius, who attempted a philosophical definition of the Trinity, and looked on the Son and Holy Ghost, not as distinct persons, but as manifestations of the Godhead. The heresy as such disappeared in the 5th century, but Sabellian views in substance are held by many

people at the present day, their doctrine being closely akin to Unitarianism. Sabellius is now little more than the shadow of a name, but is conjectured to have been an Egyptian (from Libya) resident for a period in Rome, in the 3rd century, whence he was banished by Callixtus, taking refuge in Cyrenaica (probably the modern Barca) in North Africa.

Sabine, SIR EDWARD, general and physicist, was born in Dublin on October 14th, 1788, and educated at Great Marlow and the Royal Military Academy, Woolwich. He entered the Royal Artillery in 1803, and for several years served at Gibraltar and various home stations. The only fighting in which he took part was the siege of Fort Erie, Ontario, in 1814. The long peace following the downfall of Napoleon was favourable to the pursuit of the scientific studies in which he gained his reputation. Elected F.R.S. in 1818, he sailed in that year with Sir John Ross's expedition in search of the North-West Passage, in the capacity of astronomer, repeating the voyage in 1819 in the *Hecla*, under Sir Edward Parry. He next carried out, in various parts of the globe, a series of experiments to determine the variation in different latitudes in the length of the pendulum vibrating seconds in order to ascertain the true figure of the earth. His account of the pendulum experiments appeared in 1825 and was crowned by the Lalande gold medal of the Institut in 1826. Along with Sir John Herschel and the French Commission he was engaged in determining the exact difference of longitude between the observatories of Paris and Greenwich. By the use of rocket signals this was found to be 9 minutes 21.6 seconds. The present difference, ascertained by electrical signals, is 9' 21". In later years he conducted experiments to determine the relative lengths of the seconds pendulum in Paris, London, Greenwich and Altona, and determined also the absolute length at Greenwich. He next turned his attention to the magnetic survey of the British Isles, and was instrumental in prevailing upon Government to establish magnetic observatories at various stations in both hemispheres. These began work in 1840, and Sabine superintended them during many years. In 1839 he became general secretary to the British Association, a post he held for twenty years, excepting in 1852, when he was President. In the interval he was being gradually promoted in the Army, from which he retired in 1877 with the rank of general. In 1855 Oxford made him D.C.L., and Cambridge LL.D. From 1861 to 1871 he was President of the Royal Society, and in 1869 was created K.C.B. He died, full of years and honours, at Richmond, Surrey, on June 26th, 1883. His wife, Elizabeth Juliana Leves (1807-1879), was an accomplished woman, and translated Humboldt's *Cosmos* and *The Aspects of Nature*, and Admiral von Wrangel's *Narrative of an Expedition to the Polar Sea*.

Sabines, an ancient Italian people of the Central Apennines, belonged to the Indo-

European race, and extended from Umbria to Lucania and Apulia. The Sabines, in a more particular sense, were those in the north, separated by the Tiber from Etruria, and from Rome by the Anio. They were a pastoral race, and, after being subdued by Rome in 290 B.C., received the Roman franchise. At an earlier period the Romans supplied themselves with wives by abducting the Sabine women, who, all unconscious of their doom, were interested spectators of the sports and pastimes which they had been invited to witness, when they were suddenly seized by the soldiery and carried off. This famous incident in Roman history was known as the Rape of the Sabines. The Sabines had a curious custom of protecting themselves against over-population by declaring a Sacred Spring (*ver sacrum*), i.e., forcing all those born in a certain year to emigrate and found new colonies.

Sable (*Mustela zibellina*), a fur-bearing animal of the family Mustelidae, or Weasel group, widely distributed throughout the forest regions of Siberia. It is threatened with extinction in Russia-in-Europe, although in certain districts in the Middle Ages it was so plentiful that the skin was used as a medium of exchange instead of money. The sable is about two feet long, more stoutly built and with a more bushy tail than the Pine Marten, of which it is probably a variety. The fur is lustrous brown, with a yellowish patch on the throat. It is of great commercial value, a skin of the first quality being worth more than £20. The skins have always been highly appreciated for the purposes of dress. Marco Polo found sable esteemed as the "queen of furs" among the Tatars, and the tent of the Grand Khan was



SABLE.

lined with them for warmth. A statute of Queen Mary forbade the wearing of sable by anyone below the rank of an earl, while gowns furred with sable were so valuable as to be expressly mentioned as legacies. Topsell (1658) asserted that a garment of such skins was much dearer than cloth of gold. The North American Sable (*M. americana*) appears to be hardly

distinguishable. More than 100,000 skins have been imported into Great Britain by the Hudson Bay Company in a single year. It is, however, growing scarcer, though its capture was once the staple occupation of the American trapper. According to Dr. Elliott Coues, the trap was a small enclosure of stakes or brush, in which the bait was placed upon a trigger, which, when disturbed, released a log of wood, the animal being compelled to approach the bait only in the desired direction. The log fell upon the animal and crushed it without doing much if any damage to the skin, a point of great consequence commercially. A line of traps, several to the mile, was often dressed for many miles, the bait being any kind of flesh or a bird's head. The greatest nuisance the trapper encountered was the persistent and apparently deliberately malicious destruction of the traps by the wolverene (glutton) or pekan (Pennant's marten). Dr. Coues had accounts from Hudson Bay trappers of a sable-road fifty miles long and containing 150 traps, every one of which was destroyed throughout the whole line twice, once by a wolf and once by a wolverene.

Sables d'Olonne, LES, a seaport of the department of La Vendée, France, on the Bay of Biscay, 38 miles N.W. of La Rochelle. The fisheries, especially of sardines and oysters, are the leading industry, and the magnificent sandy beach attracts crowds of visitors in summer. The port was founded by Basque sailors, and was the first place in Poitou attacked by the Normans in 817. During the wars of the Huguenot period it was frequently captured by both parties, and in 1696 sustained a bombardment by the combined fleets of England and Holland. It has produced a race of hardy sailors. Pop. (1901), 12,000.

Sabot, a shoe carved out of a single piece of wood, and much employed by the country people in France, Germany, and Belgium, many parts of these countries being noted for their manufacture. Another form of sabot consists of a wooden iron-bound sole, with sides of strong leather. This "clog" is in general use in the Lancashire manufacturing towns, where it was introduced from abroad. The name is also employed metaphorically in some trades.

Saccharic Acid possesses the composition $C_6H_{10}O_8$, being isomeric with three other allied acids—namely, mucic, iso- and manno-saccharic acids. It is obtained by the oxidation of sugar, usually by means of nitric acid. It forms a gummy, amorphous, soluble mass with a sour taste, which blackens and decomposes if heated. As ordinarily prepared, it acts on polarised light, being lævo-rotatory, though dextro- and inactive compounds can also be prepared. It forms well-defined crystalline salts, those of the alkalies being soluble in water.

Saccharimeter and **Saccharometer**, instruments used for determining the amount of sugar present in any solution such as beer, wort, etc. They may be of two forms. One measures the density of the solution, and to this kind the second name is usually applied; while the other measures the rotatory effect produced by the sugar upon polarised light. This is often known as a polariscope or polarimeter, and is described under that title. The simplest form of saccharometer consists of a hydrometer with a graduated stem projecting above the liquid. The mark which stands at the level of the liquid is read off, and the corresponding amount of sugar present is found by referring to the table devised for the apparatus. This can only be used when no other substances affecting the density are present.

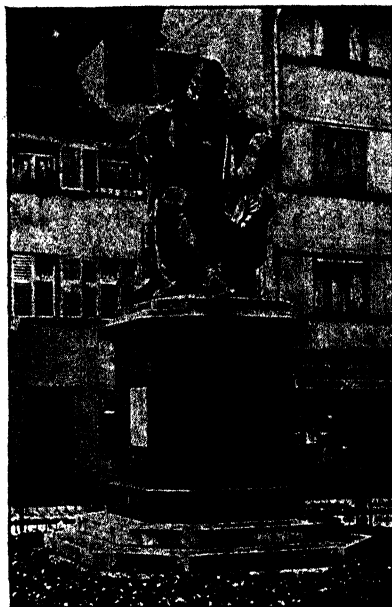
Saccharin. A number of derivatives obtained from sugars and other carbohydrates are known as saccharins, but the substance most commonly known under this name is an exceedingly sweet compound belonging to the aromatic series. This saccharin consists chemically of the imide of sulpho-benzoic acid, and has the composition represented by the formula $C_6H_4 \begin{smallmatrix} CO \\ SO_2 \end{smallmatrix} NH$. It

forms needle-like crystals, slightly soluble in cold water, more easily in hot. It has about 200 times the sweetening power of cane-sugar, and is more or less useful medicinally instead of sugar in the case of patients suffering from diabetes.

Sacheverell, HENRY, Anglican clergyman, born in Marlborough, Wiltshire, England, in or about 1674, and was educated at Magdalen College, Oxford, of which he became a fellow in 1701. He held the living of Cannock, in Staffordshire, and, in 1705, became chaplain of St. Saviour's, Southwark. He graduated D.D. in 1708. Before this he had grown notorious for his violent Tory and High Church views, enunciated both in the pulpit and through the press. One of his sermons (1702) elicited, by way of reply, Daniel Defoe's *Shortest Way with Dissenters*. On August 15th, 1709, he preached the Assize Sermon at Derby on the "communication of sin," and on November 5th he preached before the Lord Mayor, at St. Paul's, on "the perils of false brethren in Church and State." Both sermons were regarded as a contumacious indictment of the Revolution Settlement and, as such, were brought under the notice of the House of Commons (December 13th, 1709), which unwisely ordered Sacheverell to be impeached. He was a vain, foolish man, and indifferent scholar, who should have been treated with contempt. The Tories made great capital out of the impeachment, and the parson became the idol of the hour. He was tried in Westminster Hall, and (March 20th, 1710) found guilty, and suspended from preaching for three years, the two offending sermons to be burned by the common hangman. This was popularly regarded as a virtual triumph for him.

Sacheverell was presented, in the same year, to the living of Selattyn, in Shropshire, and after his punishment had expired Queen Anne presented him to St. Andrew's, Holborn. He died in the Grove, Highgate, on June 5th, 1724.

Sachs, HANS, the best of the German meistersingers, was born at Nuremberg, of humble



STATUE OF HANS SACHS, NUREMBERG.

family, on November 5th, 1494. He became a shoemaker, and remained one all his life. From one Nunnebeck, a weaver, he learned the art of rhyming, and joined the guild of singers in his native town. Sometimes he travelled a little, but it was in 1511 that he made a really extended tour to the principal towns of Germany. In 1519 he married, and, when his wife died in 1560, he married a second time. He died in Nuremberg on January 19th, 1576. He was a staunch follower of Luther, and ardently desired the Reformation, for which he wrote numerous songs and hymns of great popularity. His writings are amazingly voluminous, there being over 6,200 poems by him, including over 200 tragedies, known to scholars. Only a portion of this vast material has been printed. Goethe did much to revive interest in the man and his works. The poetry of Sachs and the other artisan-poets is more remarkable for vigour than for beauty. The house which he occupied in Nuremberg still exists, though repaired so often that probably not much of the original dwelling remains.

Sack (from *vino seco*), a name formerly applied to dry wines, especially those from Spain and the Canaries, and still later to all strong white wines. We read of "sherry-sack" and "canary-sack." These wines were generally sweetened and flavoured to taste, and sometimes warmed.

Sackbut, a musical instrument of the trumpet family, probably a predecessor of the trombone. There were three kinds—tenor, bass, and double-bass. It was known, in all likelihood, to the Romans, a specimen having been found at Herculaneum and presented to Queen Victoria. The word translated "sackbut" in the Bible, however, indicates a totally different type of instrument, a stringed instrument of the harp or possibly guitar type. It was known as the *sabeca*, which was allied to the Greek *sambuca*, triangular in shape, with four strings, which was doubtless a species of lyre.

Sackville, CHARLES, 6TH EARL OF DORSET and EARL OF MIDDLESEX, poet and courtier, was born on January 24th, 1638, and was educated privately. In 1660 he was elected member for East Grinstead, but preferred a life of pleasure to the grind of politics. Of prepossessing appearance and manners, he entered with zest upon the dissolute career of a man about town, yet he was capable of better things. In 1665 he volunteered for the fleet against the Dutch and took part in the great naval battle of the 3rd of June. It was whilst engaged in this exploit that he wrote the gay-spirited song that still keeps his name green—"To all you ladies now at land." Afterwards he relapsed to wilder ways, taking Nell Gwynne under his protection before she passed to the keeping of his Majesty Charles II. Weary of his follies he turned to the honourable course of befriending men of letters, amongst them John Dryden, Samuel Butler, and William Wycherley. He was frequently consulted, too, as an arbiter of taste not only in literature, but in art. In 1675 he was created Earl of Middlesex. During the reign of James II. he retired from Court, sympathising with the Seven Bishops and acquiescing in the invitation to William of Orange. Though he bore no part in public affairs under William, he received the Garter in 1691 and was thrice one of the regents during the king's absence on the Continent. He died at Bath on January 29th, 1706. Horace Walpole described him as the finest gentleman of Charles's voluptuous Court.

Sackville, GEORGE, 1ST VISCOUNT SACKVILLE, soldier and statesman, third son of the 1st Duke of Dorset, was born on January 26th, 1716, and educated at Westminster School and Trinity College, Dublin, whilst his father was Viceroy of Ireland. He entered the army in 1737, and fought bravely at Dettingen (1743) and Fontenoy (1745), and in 1758 was made lieutenant-general. During the few following years active service in the army was not required, and Sackville became Irish Secretary

of War from 1751 to 1756, and sat in the House of Commons for the borough of Portarlington, retaining his seat for Dover, to which he had been elected in 1741, at Westminster as well. In 1758 he was engaged in the childlike descent on the coast of Brittany. The 3rd Duke of Marlborough having died in the same year at Münster, Sackville succeeded him as commander-in-chief of the British forces. Unfortunately he soon got on bad terms with Lord Granby, his second in command, and with Prince Ferdinand of Brunswick, who apparently held supreme command. This unhappy spirit led to some misunderstanding at the battle of Minden (August 1st, 1759), the British cavalry, acting under Sackville's orders, being deprived of their share in the triumph of the day. Recriminations ensued and on September 10th he was dismissed the service. His demand for trial by court-martial was at last complied with (March 25th, 1760), and he was found guilty of disobeying Prince Ferdinand. He was adjudged unfit to serve the king in any military capacity whatever, and George II., in confirming the sentence, directed it to be given out in public orders in Great Britain and throughout the world wherever British troops happened to be employed, and also himself struck Sackville's name off the Privy Council. In 1761 he was returned for Dover, East Grinstead and Hythe, and chose to represent the last-named. A feeling meanwhile was growing that he had been treated with exceptional harshness, a sentiment shared by the new King, George III. He was restored to the Privy Council (1763) and in 1770 obtained statutory power to assume the name of Germain in terms of the will of Lady Betty Germain. He now took an active part in politics in support of Lord North, who (1775) made him Secretary for the Colonies. On February 11th, 1782, he was created Viscount Sackville, and died at his place, Stoneland Lodge, Sussex, on August 26th, 1785. He was credited with the authorship of the *Letters of Junius*, but this view has never gained general acceptance.

Sackville, THOMAS, 1ST EARL OF DORSET and LORD BUCKHURST, poet and statesman, was born about 1536 at Buckhurst, Sussex, England, and educated at Sullington Grammar School, Hart Hall (Hertford College), Oxford, and St. John's College, Cambridge. He was called to the bar, but devoted his early manhood to literature. In 1559 was published the first volume and in 1563 the second of *A Myrrore for Magistrates*, a poem in seven-line stanzas, by Richard Baldwin and George Ferrers, to which Sackville contributed the noble "Induction," or preface, besides drawing up the plan of the work. He also furnished the last two of the five acts composing *The Tragedy of Gorboduc* (1561), interesting as the first English tragedy in blank verse. Politics attracted him ultimately more powerfully than letters, and he sat in the House of Commons in 1558 as

member for Westmoreland. Next year he represented East Grinstead, and in 1563 Aylesbury. Elizabeth was his second cousin and showed much liking for him. He was created Lord Buckhurst in 1567, occasionally participated in the negotiations for the Queen's marriage, and frequently presided at State trials. It was his unhappy lot (December, 1586) to acquaint Queen Mary at Fotheringhay Castle with her sentence of death. In 1589 he was made Knight of the Garter, and in 1598 succeeded Lord Burghley in the office of Lord Treasurer. James I. continued the royal regard for him, and in 1604 he was created Earl of Dorset. He died suddenly at Whitehall on April 19th, 1608. Among the honourable poets he filled was that of Chancellor of Oxford University, to which he was elected on December 17th, 1591. His rival was Robert Devereux, Earl of Essex, but Elizabeth cast all her influence on Sackville's side. In 1566 the Queen had granted him the reversion of the manor of Knole at Sevenoaks, Kent, and in 1603 he came into full and sole possession of the property.

Sacrament; a name originally signifying either the Roman military oath or the money deposited, before the hearing of the case, by parties to a lawsuit and forfeited to so-called sacred purposes by the unsuccessful litigant. It is used in the Vulgate as equivalent to the Greek *mysterion*, hence its adoption as the name of a symbolical religious ceremony. The Church defines a sacrament as an "outward visible sign of an inward spiritual grace" imparted. The Greek and Roman Churches have seven sacraments—Baptism, Confirmation, the Eucharist, Penance, Orders, Marriage, and Extreme Unction. Of these the English Church holds only the first and third to be sacraments in the full sense.

Sacramentarian, a word repeatedly found in ecclesiastical literature and having two well-defined meanings. In the first place, it may signify a person entertaining advanced views of the efficacy of the sacraments and particularly that of the Lord's Supper. In this sense the term is almost confined to Anglican writings, chiefly of a polemical or at least controversial character. It may, in the second place, be employed more broadly to denote those early Protestants who differed from Martin Luther in consequence of his dogmatic utterances on the subject of the Real Presence. The great Reformer did not, indeed, hold the Roman Catholic doctrine of Transubstantiation, but taught that the body and blood of Jesus are present, in a manner that could not be explained, in the unchanged bread and wine. From this doctrine, known as Consubstantiation, Ulrich Zwingli, the Swiss Reformer, emphatically dissented, contending that the Communion is purely a commemorative rite, the bread and wine merely symbols. John Calvin held that though the body and blood of Christ were not physically

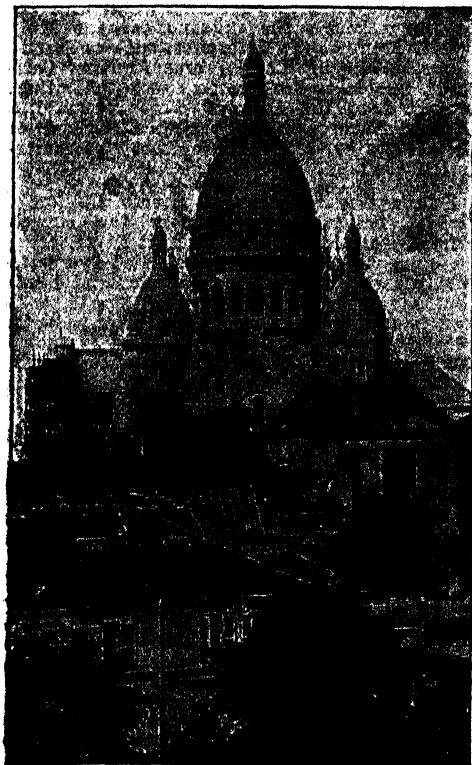
present, yet in the act of partaking of the cup and eating the bread the receiver is brought by faith into intimate union with the Saviour through the influence of the Holy Spirit. Many of the Reformers, such as Martin Bucer, Wolfgang Capito, and Andreas Carlstadt, unable to see eye to eye with Luther, presented to the Diet of Augsburg (1530) a Confession representing their belief, and of them more especially the epithet "sacramentarian" is used.

Sacramento, the largest river of California, United States. It rises near the Oregon border, its chief head water, Pitt River, being an affluent from Goose Lake. It flows westwards through the Sierra Nevada, and bends southwards below the town of Shasta, ultimately falling into Suisun Bay, after a course of 500 miles. It is navigable by small steamers to Red Bluff, a distance of nearly 300 miles, but larger vessels cannot ascend beyond the town of Sacramento.

Sacramento, the capital of California, United States, on the left bank of the Sacramento, 90 miles N.E. of San Francisco. The streets, which are broad, with trees on each side, are arranged on a rectangular plan, and there are many handsome private dwellings with large gardens. It has a mild, healthy climate, with a mean yearly temperature of 60°F. The principal buildings are the State Capitol, a magnificent structure standing in a park of 50 acres, the city hall, Roman Catholic Cathedral, Masonic Temple, the Crocker Art Gallery, Christian Brothers' College, and St. Joseph's Academy. The works of the Southern Pacific Railway are situated here, and the industries include slaughtering and meat-packing, ore-smelting, brewing, distilling, flour-milling, lumbering, saddlery, and the making of furniture and builder's sashes and doors. The town was settled in 1839, but it was not till the great rush following the discovery of gold in 1848 that it made headway. Pop. (1900), 29,282.

Sacred Heart of Jesus, THE FEAST OF, a festival of the Roman Catholic Church. In the convent of the Visitation at Paray-le-Monial, a town in the department of Saône-et-Loire, France, a nun named Marguerite Marie Alacque (1647-90) was honoured with frequent ecstatic visions of the Saviour—in one of which He had taken out her heart, placed it in His own flaming one, and then returned it to her—and pilgrimages gradually grew customary and confraternities of the Sacred Heart were established. The festival received formal sanction in 1765 from Pope Clement XIII., but was at first limited to France. In 1856 the universal church was permitted to participate, and eight years later the foundress-nun was beatified. The magnificent church which crowns the heights of Montmartre, in Paris, is the grandest edifice yet dedicated to the *Sacré Cœur*. It was opened in 1891, having taken

sixteen years to build, and cost £1,000,000 sterling.



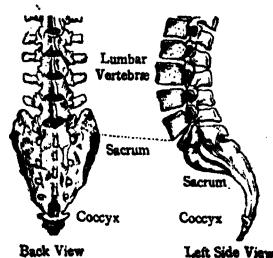
CHURCH OF THE SACRED HEART, MONTMARTRE

(Photo: L. L., Paris.)

Sacrifice, the act of making an offering, or the thing offered, to a deity. Sacrifice of some kind finds a place in nearly all religions. E. B. Tylor supplies us with a clue to the origin of the rite. "As prayer is a request made to a deity as if he were a man, so sacrifice is a gift made to a deity as if he were a man" (*Primitive Culture* ii. 375). What is generally called the "sacramental meal" theory of the origin of sacrifice does not appear to rest on solid ground, though in many cases the rite which began as a simple offering from a mortal to a deity developed into a sacramental meal, of which both mortal and deity partook. At first he who provided the offering was his own priest. Later there was developed a priestly caste standing between their fellows and the deity, and to them the duty of offering sacrifice was confined. Sacrifices were of two kinds—bloody, when the victim was killed, and unbloody, when the offering consisted of fruit, flowers, cakes, wines, etc. Tylor suggests that sacrifice has passed through three stages:—(1) It is offered as a simple gift; (2) it is offered as

an act of homage or propitiation; (3) something valuable to, or greatly prized by, the sacrificer is offered. As food was the most valuable thing known to primitive man, and as the gods of his making were like unto himself, his gifts to them probably took the form of food. In course of time, when the gods were conceived as without bodily wants, sacrifices were offered by fire, and the deities were supposed to be pleased with, and placated by, the smell of the burning flesh. Of Noah's burnt-offering we read that the "Lord smelled a sweet savour," and the statement may be paralleled in the classic poets (*cf. Iliad* i. 317; Ovid, *Metamorphoses* xii. 154). It seems probable that at this stage the sacramental meal came in, for in the Jewish Scriptures we find minute details as to the parts to be eaten by the priests (who represented the people). The last stage found its highest expression in human sacrifice, in which the victim was sometimes self-dedicated, as when Marcus Curtius leaped into the gulf, and so gave to the gods "the most precious treasure of Rome." Many instances of, and references to, human sacrifice occur in the Jewish Scriptures; in one place at least with the direct idea of atonement—"Shall I give my first-born for my transgression, the fruit of my body for the sin of my soul?" (Micah, vi. 7).

Sacrum, the bone formed by the union of the five sacral vertebrae at the base of the vertebral column, or backbone, and articulating on each side with the two hip-bones forming the posterior part of the pelvis.



SACRUM.

Sacy, ANTOINE ISAAC, BARON SYL-

VESTRE DE, Orientalist, was born at Paris in 1758, and was induced by a learned Benedictine, named Berthereau, to study the Eastern tongues. His proficiency was such that in 1785 he was made associate of the Academy of Inscriptions, and, in 1793, published his *Mémoires sur les antiquités de la Perse*. Two years later he was appointed to the chair of Arabic founded by the Convention. In 1806 he became Professor of Persian at the College of France, and in 1808 entered the Chamber as representative of the Seine. In 1810 his *Grammaire Arabe* appeared, and in 1814—in which year also he was promoted Baron—his *Chrestomathie Arabe* was published. He was made Rector of the University of Paris in 1815, in 1823 Principal of the College of France, and next year Principal of the Oriental School. He was created a peer by Louis Philippe (1832) and keeper of the royal collection of Oriental manuscripts. He died in Paris in 1838. He

was the father of modern Oriental studies, and among others of his works were numerous translations from the Arabic and the *Exposé de la religion des Druses* (1838).

Sadducees, a sect existing among the Jews in the time of Christ. The name has been variously derived from a word signifying "the righteous"; or from one Zadok, head of the Sanhedrin in the 3rd century B.C.; or from one Zadok the priest, who crowned Solomon, and whose descendants and adherents may have enjoyed especial privileges and adopted special tenets. The third suggested derivation is regarded as the most likely, and the first is now generally given up. From the New Testament we learn that they disputed the Pharisaic traditions, did not believe in a resurrection, and in some degree, as to which there is much dispute, did not believe in angels or spirits. Though they were the priestly aristocracy, while the Pharisees were drawn mostly from the common people, the opposition between the two was rooted not so much in class prejudices and hostility as in temperament and character. The Pharisees were deeply religious according to their lights, while the Sadducees were indifferentists in religious affairs, believed in man's free will, were intensely interested in the State as a State, and lived in a present of comfort and splendour, without much care for the morrow and none at all for a future in which they had no faith. Though it was not till near the close of His career that Jesus came into conflict with them, they sided against Him without demur, and probably formed the majority of the Sanhedrin that tried and condemned Him. With the destruction of Jerusalem they disappeared from history. Josephus, the only non-Scriptural authority on them, was a Pharisee.

Sadi, or **SAADI**, **SHEIKH MUSLIM UDDIN**, poet, was born at Shiraz, in Persia, about 1184. He was a student at Baghdad, and was initiated into theological learning by a zealot of note, named Sophi abd al Kadir Ghilani, with whom he went to Mecca. This was the first of a series of fifteen pilgrimages to the holy place undertaken by Sadi, who several times aided the war against the infidels, and extended his wanderings into Asia Minor and India. He was taken prisoner by the Turks on one expedition, and was condemned to work as a slave at the fortifications of Tripoli. A rich merchant of Aleppo ransomed him, and gave him his daughter in marriage. Sadi spent the remainder of his life in a hermitage, which he had built near Shiraz, where he died in 1292, at the patriarchal age of 106 years. His tomb was visited as a holy place for generations. His poems are very beautiful, and have been often translated. Most remarkable of his works is the *Gulistan* (or "Rose Garden"), a collection of tales in prose interlarded with poems, distinguished by elegance, simplicity and wit.

Sadoletto, **JACOPO**, Cardinal, was born at Modena, Italy, in 1477, educated at Ferrara, and began to write Latin poetry at a youthful age. He became famous for his proficiency in verse, and was accounted one of the best Latin poets of his day. Leo X. made him one of his secretaries, afterwards giving him the see of Carpentras. Sadoletto was also a philosophical student and very learned. Paul III. created him a cardinal (1536), and gave him some important missions. He was entrusted in 1538 with the task of endeavouring to win John Calvin and his followers back to the fold after their banishment from Geneva, and he corresponded with Calvin on the subject. He died at Rome in 1547.

Safe, a fire-proof room or box used for the safe keeping of valuables. It may be either fixed or portable, the name being more generally applied to the latter, and having a wide range of application from the household meat-safe to the highly-elaborated bank-safe, which is constructed of the strongest and least perishable materials, and so contrived as to preserve its contents safe from fire, craft, or violence. Burglar-proof safes are marvels of strength and ingenuity, as are also the various combination and time locks which make it almost impossible to obtain entrance without the proper key and a knowledge of its manipulation. In London, New York and other great commercial centres fire-proof buildings are erected where safes may be deposited for greater security than can usually be obtained in most houses. In some of these institutions the number so kept amounts to many thousands. None can be opened unless the renter and custodian are present together.

Safed, or **SAFAT**, a town of Palestine, 7 miles N.W. of Capernaum, on the Lake of Tiberias. It is the most elevated place in Galilee, lying at a height of 2,750 feet above the sea. By the Jews the town is regarded as holy, because, according to their tradition, the Messiah will come from it. The Castle, built by the Crusaders, which Saladin had great difficulty in reducing, was demolished in 1220 by the Sultan of Damascus. It was restored by the Templars but is now ruinous. Safed has suffered terribly from earthquakes, in that of January 1st, 1837, more than half of the population perishing (5,000 out of 9,000). The Jewish colony, settled here in the 16th century, was soon followed by the foundation of a learned rabbinical school, which supported many synagogues and a printing office. Weaving and dyeing are carried on. Pop. (estimated), 25,000, of whom about one-half are Jews.

Safety-Lamp. It was discovered by Sir Humphry Davy, in 1815, that flame will not in ordinary circumstances pass through fine-meshed wire gauze, the contact with the metal cooling down the particles of gas to such an extent that they are incapable of inflaming the gas on the other side of the partition. It is

essential that a safety-lamp to be used in mines liable to contain firedamp (light carburetted hydrogen) should be incapable of igniting an explosive atmosphere, and this end was attained by Davy by enclosing the flame of the lamp in a chimney made of and closed at the top with wire gauze. The oil-holder of such a lamp is made of brass, and care is taken so to secure the gauze to the body that no opening larger than the meshes exists. When such a lamp is taken into an inflammable atmosphere, the gas is ignited inside the lamp, which may thus be filled with flame, but an explosion is avoided. The presence of burning gas in the lamp thus serves to warn miners that the atmosphere has become dangerous. Dr. W. R. Clanny, a physician of Sunderland, in 1812, and George Stephenson, the illustrious engineer, working independently of each other, and of Davy, also invented safety-lamps. The actual priority would seem to belong to Clanny, although his lamp was wholly different from the others and did not come into general use. Davy's invention found most favour. In recent years many attempts have been made to make electric safety-lamps, as then it is easy so to arrange matters that there is no chance of igniting explosive gas, and at the same time the light is much increased. Secondary or primary batteries have been used, but the weight and cost of the arrangement are greater than that of the Davy lamp, and, possibly from these causes, their use has up to the present time been limited.

Safety-Valve, an appliance used to indicate and relieve excessive pressure in steam-boilers or other vessels containing fluids under pressure. It usually consists of a conical plug fitting into an aperture or seat, and held in place by a lever and weight. As soon as the pressure exceeds a limit which is determined by the area of the valve, the length of the lever, and the mass of the weight, the plug is lifted, producing an escape of the steam or fluid, and reducing the pressure. In some cases a spring is used instead of a weight, and in others a weight is placed directly upon the plug without the intervention of a lever.

Saffi, a port of Morocco, Africa, on the Atlantic coast, 100 miles N.W. of the city of Morocco and 300 miles S.W. of Fez. Its importance as a trading centre has been affected by the rise of Mogador, but still much wool and grain are exported from it. The want of a good harbour, however, jeopardises its prosperity. Pop. (estimated), 15,000.

Safflower, the flower-heads of *Carthamus tinctorius*, the "koosumbha" of India and "Hoangtchi" of China, also sometimes designated "bastard saffron." Its native country is unknown, but it was formerly largely cultivated in Bengal, China, Egypt, and Southern Europe. It has an erect whitish stem over two feet high, spinous leaves, no pappus, and orange corollas. It yields two

colouring matters, yellow and red, and is used for dyeing silk various shades of red, and as an adulterant of saffron. "Pink saucers" are coloured with safflower, and with steatite it constitutes rouge. Its seeds yield koosum oil, which is used in India in cooking and for burning, and in Europe for soapmaking. The flower-heads are imported in small flat circular cakes into the countries employing them as a dyestuff; but in consequence of the increased use of aniline dyes, the once considerable export from India has dwindled to insignificant proportions.

Saffron, the dried orange-coloured stigmas of *Crocus sativus*, a species unknown in a wild state, but cultivated in the neighbourhood of Saffron Walden, Essex, till 1768, in Cambridgeshire to a slight extent till the present day, and also in Spain and in the French department of Loiret. Not yielding a permanent dye, it is now little used as a dye, but is employed as a colouring agent in pharmacy and to some extent in confectionery. The Cornish Saffron cake is famous. One grain contains the stigmas of nine flowers—i.e., 4,320 go to the ounce. It has a bitter taste and an aromatic odour, and in large quantities is narcotic. It yields three-fourths of its weight of an orange-red extract, still extensively used on the Continent and in India. The best quality comes from Valencia, that from Alicante and Barcelona being loaded with heavy mineral matter. When formerly it was in higher repute for wholesomeness, it took the place in stewing pears now occupied by cochineal. (See Shakespeare's *Winter's Tale*, act iv. scene 1.) The so-called autumn crocus or meadow saffron is a colchicum and has nothing to do with this plant or substance. The name "saffron" is of Arabic origin. So small a portion of the plant being available, temptations to adulterate it have been irresistible, safflower being the favourite substitute.

Saffron Walden ("Saffron Woods"), a town of Essex, England, 14 miles S.E. of Cambridge. The church of St. Mary the Virgin, mostly dating from the reign of Henry VI., is a remarkably fine example of Late Perpendicular. In the south chancel aisle is the marble tomb of Henry VII.'s Lord Chancellor, Thomas, Lord Audley, who built the chancel and part of the nave. The town is well supplied with educational establishments, amongst them being the Grammar School (founded 1423, remodelled 1879), the British and Foreign School Society's training-college for mistresses, the Friends' School for boys and girls (the oldest foundation school of the Quakers), and the Charity School (founded 1717). Other buildings include the town hall, in Early English; the Corn Exchange, in Italian; the Museum on Castle Hill; the Literary Institution; the Hospital, and several charities. The industries comprise iron-founding, brewing, flour-milling, malting, and sawing. The Horticultural

Society (founded 1819) is the oldest in England, and the Essex Agricultural Society (established 1830) was one of the earliest of such organisations. Of the Castle, erected in the time of Stephen, all that remains is the revived keep, now only 25 feet high. On the Common is the curious feature called The Maze, which Dr. Stukeley, the antiquary, held to be a military manœuvring-ground of the British period. It consists of several concentric circles, with four outworks, all cut in the chalk, and encloses an area measuring 138 feet from north to south, and 100 feet from east to west. It has been re-cut at different times, by the Corporation in 1629, by public subscription in 1887, and on other occasions at the cost of private persons. At the opposite side of the town is the remnant of an ancient encampment, now known as Battle Ditches, in the form of a parallelogram, enclosing some 30 acres of land. At various dates a considerable number of skeletons have been exhumed here, on some of which were found fragments of Saxon ornaments. The Benedictine Priory, founded in 1146, was raised to the rank of Abbey in 1191. Not far from the site of the Abbey, Audley End, 1½ mile to the south-west of the town, the seat of Lord Braybrooke, is a handsome mansion, dating from the early part of the 17th century, when it was built for Thomas Howard, first Earl of Suffolk. Pop. (1901), 5,896.

Sagan, a town of Prussian Silesia, Germany, on the right bank of the Bober, a tributary of the Oder, 60 miles S.E. of Frankfort-on-the-Oder, and 105 miles S.E. of Berlin. Formed in 1397 out of the Duchy of Glogau, the subordinate principality of Sagan has repeatedly changed masters, its most distinguished owner being Wallenstein, who possessed it from 1627 till his death in 1634. The chief buildings are the ducal palace and the hospital, founded by the Duchess Dorothea. In addition to iron-founding and brewing, there are manufactures of cotton and woollen goods, pottery, glass, and paper. Pop. (1900), 15,000.

Sagar, or SAUGOR, a district of the Jabalpur division in the extreme north-west of the Central Provinces, India, occupying an area of 4,005 square miles. The surface is mostly hilly, interspersed with cultivated plains of red alluvium and black soil. The streams, generally small, flow towards the Ganges valley. Wheat, rice, cotton, sugar-cane, and oil-seeds are the chief crops, the first-named the staple. Pop. (1901), 470,666. **SAGAR**, the chief town, is situated beside a fine lake of the same name, along the shores of which are bathing ghats and Hindu temples. It carries on a trade in salt. Pop. (estimated), 45,000.

Sagasta, PRAXEDES MATEO, statesman, was born at Torrecilla, in the province of Logroño, Spain, on July 21st, 1827. He entered the Constituent Assembly or Cortes at Madrid in 1854. His strenuous opposition to Queen Isabella obliged him to leave Spain twice, but on her

flight he became a minister. He was leader of the Liberal party, and formed a Government in November, 1865. Resigning in 1890, he became Premier again in 1892, 1897-9, and 1902. It was his misfortune to be in power at the time of his country's conflict with the United States, for, reaping an ill crop where he had not sowed, he had to undergo the obloquy and disgrace implied by defeat and the loss of Cuba, Porto Rico, and the Philippines. He did not long survive the conclusion of the disastrous peace, dying in 1903.

Sage (*Salvia officinalis*), a familiar pot-herb belonging to a genus of Labiatae which includes many species with showy flowers well known in gardens. The woolly leaves have an aromatic bitter taste, and are used, among other culinary purposes, in the preparation of force-meat or "stuffing" for pork or geese, and to flavour or "qualify" soups as a preventive of flatulence. The leaves, infused as tea, make, along with vinegar, or alum and honey, an excellent gargle for relaxed throat. Oil of sage has also been employed in liniments for rheumatism, though not so generally esteemed as a remedy as it once was.

Saghalien, or SAKHALIN, a long, narrow island off the east coast of Siberia, between 46° and 50° 30' N. and 141° 50' and 144° E. It is about 570 miles long from north to south, the breadth varying from 17 to 90 miles. Its area is estimated at 29,336 square miles. It is separated from the mainland by the Gulf of Tartary, and from the island of Yezo, in Japan, by the Strait of La Pérouse; on the north and east is the Sea of Okhotsk. Mountain ranges of 5,000 feet, clad with forests, run from north to south. The climate is very severe, cold mists occurring frequently even in summer. Fur-bearing animals are plentiful, but the climatic conditions are adverse to the culture of the soil. Russia obtained Saghalien from Japan, in exchange for the northern Kurile Islands, in 1876, and established a settlement of convicts, who are engaged in working the coal-mines. By the treaty of peace, signed at Portsmouth, New Haven, on September 5th, 1905, however, Russia ceded the southern half of the island to Japan. Pop. (estimated), 32,000, of whom fully two-thirds are convicts.

Saginaw, capital of Saginaw county, Michigan, United States, on the Saginaw, at the head of navigation, 96 miles N.W. of Detroit. Among the principal buildings are St. Andrew's Academy, the Germania Institute, and Hoyt Library. The manufactures include machinery, flour, bricks, and plate-glass, besides breweries and iron-foundries. It has also large railway works, and drives a flourishing traffic in lumber, coal, and salt. Pop. (1900), 42,345.

Sagitta. [CHÆTOGNATHA.]

Sago, the granulated starch obtained from the pith of various species of palm, chiefly in the East Indian Archipelago, and shipped from Singapore. *Metroxylon* (*Sagus*) *Rumphii* and

M. lœve, the chief sago-yielding species, are especially cultivated in the islands of Ceram and Borneo (including the state of Sarawak). Inferior kinds are derived from the Gomuti



SAGO: PALM, FLOWER, AND RIPE FRUIT.

Palm (*Arenga saccharifera*), the Kittool Palm (*Corypha urens*), the Cabbage Palm (*Corypha umbraculifera*), *C. Gebanga*, and other species. They grow in low marshy situations, becoming mature in about fifteen years, when they are felled and split, and the abundant starch is washed out of the central spongy tissue and passed through sieves. Were the fruit allowed to form and ripen, all this tissue would be absorbed, the stem becoming hollow and the tree dying directly after fruiting. Sago is imported in three finenesses—common brown or large sago, pearl sago, and sago flour, in small boxes or bags of $\frac{1}{2}$ to 2 cwts. each. Apart from its use as an article of diet, sago is largely employed in the making of starch and by manufacturers of cocoa as a stiffening blend. The average yield of a tree is estimated at about 700 lbs.

Saguntum, an ancient city of Spain, in Hispania Tarraconensis, near the mouth of the Pallantias, where now stands the town of Murviedro. It was a busy mart in classical times, but owes its fame to the persistency and courage shown by the inhabitants when besieged by the Carthaginians under Hannibal in 219 B.C. After a siege of nearly a year, when further resistance had become useless, the men marched forth for a final sally, whilst the women threw themselves with their children on a pyre composed of all their worldly goods. This event was the immediate cause of the Second Punic War.

Sahara, the great North African desert, lying between the Barbary States (Morocco, Algeria, Tunis, Tripoli) in the N., the Atlantic coast in the W., and the Nile Valley in the E. Its

limits are approximately 16° and 33° N., and 17° W. and 33° E., and its area is estimated at 2,500,000 square miles. The north-eastern portion, the Libyan Desert, slopes northwards towards the Mediterranean. It was formerly supposed that the Sahara was the bed of an ancient sea, that it lay below the sea-level, and that it was composed entirely of tracts of sand, the position of which was constantly changing. Recent explorations, however, have shown that the surface is extremely varied and in most parts more or less elevated, rising at one spot to a height of at least 8,000 feet. On the north it is enclosed by a semi-circular range of parallel sand-dunes, extending from Fezzan to the vicinity of Cape Blanco. The central region, south of Algeria, consists of a tableland of 4,000 feet, called Ahaggar, with mountains of 6,500 feet, on which the snow lies for three months in the year. Still more lofty are the eastern ranges, the altitude of Mount Tusidde, in the Tibboo region, being 8,000 feet above the sea. The mountains in the west do not exceed 2,000 feet in height. Along the valleys which abound in the mountainous regions lie the beds of ancient rivers, from which water may be obtained at no great distance from the surface. They thus afford pasturage for cattle, sheep, and camels, and are nearly always inhabited. The parts of the Sahara called "hammada" have a level surface covered with masses of granite and other rocks without vegetation of any kind; elsewhere there are wide salt marshes from which the water has evaporated, and large tracts are composed entirely of sand or of small round stones. The oases often extend in a continuous line right across the desert, as, for example, that from Morocco to Cairo through Taflet, Tuat, and Ghadames. There is a similar line from Mourzouk, in Fezzan, to Lake Tchad and several others which furnish a means of communication between the Soudanese states and the shores of the Mediterranean. The caravan-trade carried on along these routes consists chiefly in the exchange of ivory, gold-dust, ostrich-feathers, gums, spices, and salt, for manufactured articles, jewellery, etc. Several schemes have been put forward by the French for constructing a railway from the Mediterranean to the fertile regions of the interior. Their purpose is probably political as well as commercial, for they aim at gaining possession of the vast region between Algeria and Tunis and their colonies on the Senegal and the Niger. The agreement between Great Britain and France, drawn up in 1890, leaves France at liberty to take possession of these lands so far as Great Britain is concerned. Various proposals have been mooted from time to time for the reclamation of the vast desert, such as Captain Roudaire's plan (1874) to create an inland sea by admitting the water of the Gulf of Gabes into the salt lakes (*shotts*) in the extreme south of Tunis; Donald Mackenzie's project (1877) of flooding the western area; and the French system of boring artesian wells at different spots.

It is doubtful whether the first project would have the effect of modifying the climate over a considerable region. The second scarcely got beyond the academic stage, since there is no reason to suppose that the interior is more than a very shallow depression, and is often hilly. But the third plan has yielded en-

innocuous to man), and a variety of fishes, many edible. The rivers are the Hindan, West Kali Nadi, Solani, and tributaries of the boundary rivers. Owing to the Ganges and East Jumna canals cultivation has reached a high degree of excellence. The chief crops comprise wheat, barley, pulse, sugar-cane, oil-seeds, all

usually reaped in March, rice and vegetables gathered in October. Cotton and indigo are grown, but cereals are the principal products. The minerals are insignificant, even building-stone having to be imported as a rule. The manufactures include coarse cloth, jewellery, and sweetmeats, besides wood-carving, leather-working, and the machinery, tools, and instruments turned out at the Rurki workshops. Pop. (1901), 1,046,412.



VIEW IN THE SAHARA.

(From a photograph taken by Dr. Rohlf's Expedition.)

couraging results. After rising much above 100° F. in the day time, the thermometer often falls to freezing-point, or lower, during the night. In most parts of the Sahara rain falls only at intervals of two, three, four, or even five years. Outside the oases the vegetation consists chiefly of coarse grasses, tamarisks, and thorny trees or shrubs, such as the prickly acacia. The antelope, giraffe, and jackals are among the commonest quadrupeds. The salt and dates obtained in the Sahara form important articles of food. The inhabitants are Berbers—namely, Moors towards the coast and Touaricks (Tuaregs) farther inland, Tibboos, a mixed race of Berbers and Negroes, in the region south of Tripoli, and pure Negroes, Arabs, and Jews east of the Touaricks. The trade is mainly in the hands of the Touaricks. The number of the inhabitants has been vaguely estimated at from 1,500,000 to 2,500,000.

Saharanpur, a district in the Meerut Division of the North-western Provinces, India, bounded on the N. by the Siwalik Hills, on the E. by the Ganges, on the S. by the District of Muzaffarnagar, and on the W. by the Jumna. It occupies an area of 2,240 square miles. It forms the most northerly portion of the Doab, the great alluvial upland tract between the Ganges and Jumna. The southern face of the rugged Siwaliks is scored by magnificent ravines, and at the base of the hills is a forest belt, the haunt of the tiger. Other wild animals are the leopard, lynx, hyana, wolf, elephant, several kinds of antelope and deer, the Siwalik python (which is a monster in size,

the headquarters of the preceding District, situated in 29° 58' N., 77° 35' E. It lies in a low and damp country, and was formerly very unhealthy, but the malarious lake in the neighbourhood has been drained. The Mohammedans, who form the majority of the population, possess a very handsome mosque of comparatively recent construction. The Government botanic gardens (1817) cover about 50 acres. The city is a station of the Great Trigonometrical Survey. Pop. (1901), 63,850.

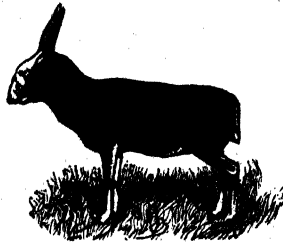
Sahib (an Arabic word, originally meaning "companion"), a title of respect used by the natives throughout India and Persia in addressing Europeans or speaking of them. Commonly, it is the equivalent to "Master" (Mr.) and "Sir." It is generally affixed, too, to the status or office, such as "Lord Sahib," "Colonel Sahib." Occasionally it is employed among Hindus and Mohammedans as a specific title, as in the familiar instance of Tippoo Sahib. In addressing ladies the word is naturally modified. Sahiba is the female form and means "lady," but colloquially the hybrid term "Mem Sahib," *mem* being *ma'am*, is more frequently used in the Bengal Presidency when addressing a married lady, and corresponds to "Mistress" or "Madam." In Bombay this is replaced by the form "Madam Sahib."

Saiga (*Saiga tartarica*), an antelope from the Steppes of Eastern Europe and Western Asia. It is about the size of a fallow deer, tawny yellow in summer, and light grey in winter. The nose is very large, convex, and inflated, so

Saharanpur, a city and the administra-

that the animals have to walk backwards as they graze. The horns occur only in the male, and are under twelve inches long and annulated. Though the saiga runs fast, it is soon exhausted.

Saigon, a city of Indo-China, the capital of French Cochinchina, situated on the Saigon river (one of the branches of the Mekhong delta) in 10° 47' N., 106° 45' E. Since 1861 a handsome town of European aspect has sprung up, with a cathedral, a palace for the governor, an arsenal, docks, etc. The trade is mainly carried on by the Chinese, who mostly reside in the market town of Cholon, the largest commercial centre in Cochinchina. Saigon does a considerable trade in rice and rice-flour, which are exported to many Asiatic and European ports, as well as in cinnamon and other spices. It also possesses copper-foundries, potteries and marqueterie works. Pop., Saigon (1901), 47,577; Cholon (estimated), 127,000.



SAIGA.

Sail (derived from the Latin *sagulum*, "a cloak"), a device used on board a boat or ship for catching the wind and so propelling the vessel. It generally consists of several breadths of canvas, served with a double seam at the corners, and edged by cords called bolt-ropes. Sails used on square-rigged vessels and fixed on yards are called square-sails; those fixed on a gaff, boom, or stay, are called fore-and-aft sails. The top of a square sail is the head, the bottom the foot, the weather- or windward-side is called the luff, the other side the after-leech. The two lower corners are called clues, the weather clue being the tack. The sails take their prefix from the masts, and consist of courses, topsails, and top-gallant-sails. Other varieties are lug-sails, which are extended on a yard hauled nearly to the top of a mast, spritsails, the outer upper corner of which is extended by a sprit or boom going from the bottom of the mast, and lateen sails, which are much used in the East and have a long yard or boom affixed to a short mast. Many other sails are also in use, and on some yachts silk is employed as a material. Sails are also used on windmills to catch the wind.

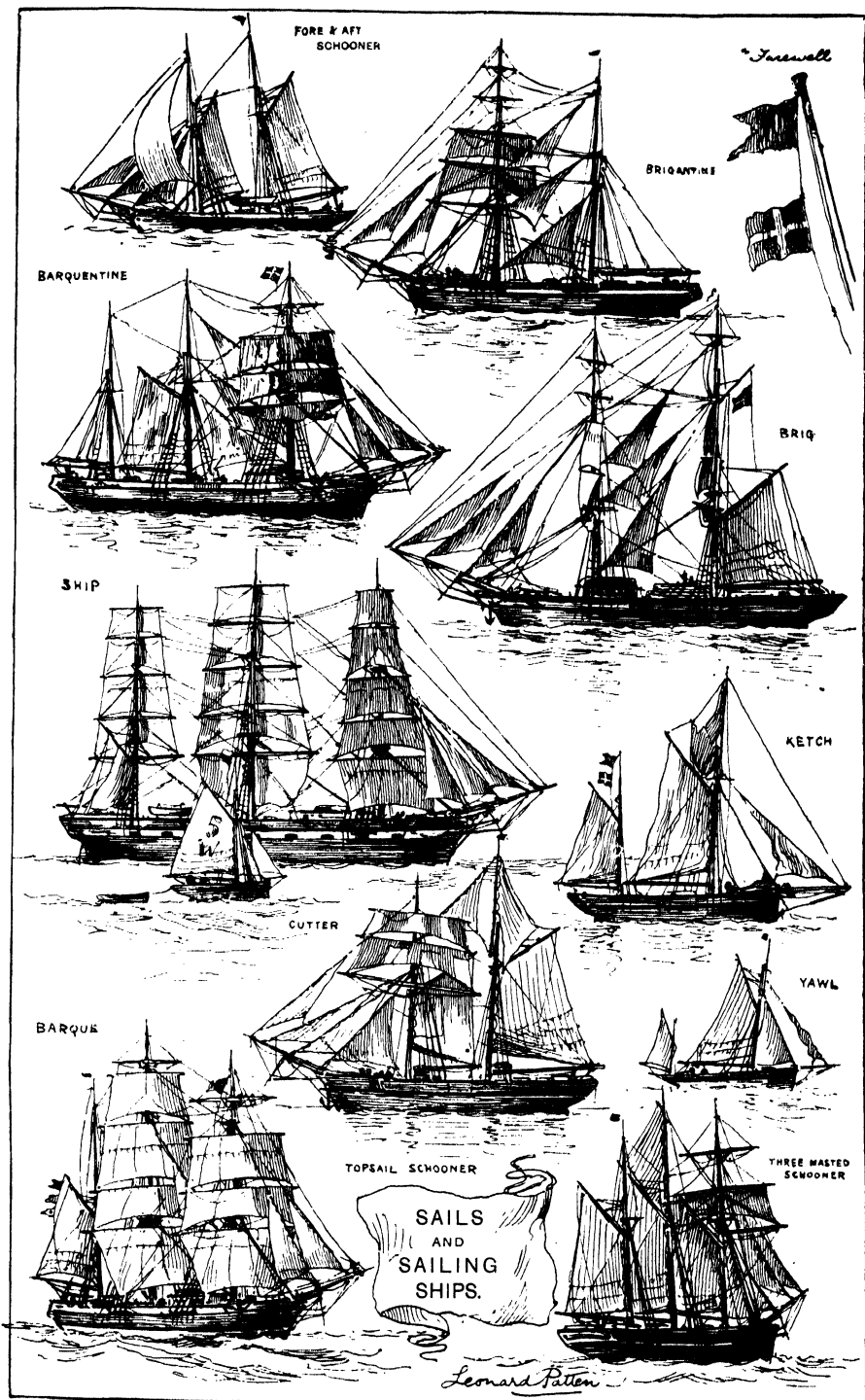
Sainfoin, or SAINTFOIN, *i.e.*, "wholesome [*sanus*, not *saint*, "holy"] hay" (*Onobrychis sativa*), is a handsome leguminous plant, with pinnate leaves, dense pyramidal racemes of pink papilionaceous flowers, marked with lines of a deeper shade, and wrinkled one-seeded pods. It is doubtfully native on the chalk downs of south-east England, and, though indigenous to Central Europe, is often an escape

from cultivation. It is much grown as fodder for milch-cows and for sheep during winter.

Saint, a word much employed, especially in the Christian religion, to denote a holy man or being, or sometimes thing. In its strictest sense in theology it is applied to angels, apostles, and holy men and women, and generally only to such as have been canonised by due authority. Thus most of the Saxon saints were without canonisation. It is also used to denote the pure and upright, and has been arrogated by certain sects as a name to distinguish them. It is also used to denote the blessed dead, and all members living and dead of the Christian Church. Thus, the Church of England speaks of the "communion of saints," and prays, "Make us to be numbered with Thy saints." The Mohammedans have great reverence for their saints.

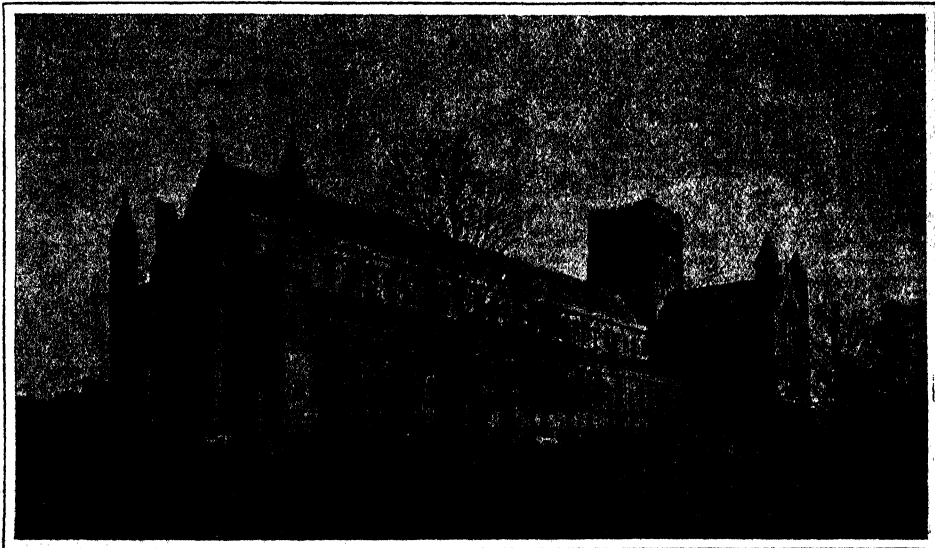
St. Abb's Head, a promontory on the coast of Berwickshire, Scotland, 4 miles N.W. of Eyemouth. The cliff, 310 feet high, carries a lighthouse, the light of which is visible for 21 miles. On the eastern side of the cape are the ruins of the kirk founded in the 7th century by St. Ebba, from whom the promontory was named.

St. Albans, a city of Hertfordshire, England, on Watling Street and the river Ver, 21 miles N.N.W. of London. It is situated on the slope of a hill near the site of the Roman station, Verulamium, which was originally a British town. A Benedictine monastery was founded here by Offa, King of Mercia, in 793 to commemorate St. Alban, a Roman soldier who suffered for his faith some 500 years earlier, and became the proto-martyr of Britain. The abbey-church was rebuilt in the latter part of the 11th century, and preserves its Norman character in spite of various new features in each of the Gothic styles. It is exceptionally long, the distance from east to west being 548 feet. Since 1871 the church has been restored by the pious munificence of the first Lord Grimthorpe, and is now one of the most superb buildings of the kind in England, being made, in 1877, the cathedral of a new diocese. The shrine of the saint, reduced to fragments in the 16th century, has been reconstructed by Sir Gilbert Scott, and there is a fine monument of Humphrey, Duke of Gloucester. Other well-known churches in the city are St. Peter's, which contains some Early English work and a Perpendicular window; St. Stephen's, believed to have been founded in the 10th century, and possessing a brass eagle lectern which once belonged to Holyrood Abbey and was probably stolen during the Earl of Hertford's expedition of 1544; and St. Michael's, occupying the site of a heathen temple within the limits of the ancient Verulamium, noted for its monument of the illustrious Sir Francis Bacon, representing the great philosopher seated in a high-backed chair within a round-headed niche. The grammar school, founded in



1553, is now located in the abbey gatehouse. The public buildings include the Corn Exchange, the Clock House containing the curfew bell, the Court House in the Italian style, the Town Hall, the Public Library, the Sisters' Hospital for Infectious Diseases, and several other charitable institutions. The industries include silk-weaving, straw-plaiting and trimming (the making of straw hats being a staple manufacture), brewing, malting, boot-making, brush-making, and printing. On May 23rd, 1455, the first battle of the Wars of the Roses was fought at Key Field, south-east of the city, when Henry VI. was taken prisoner; and the second battle was fought on Bernard's

S.E. of Dundee. It is built on a sandstone plateau, 50 feet above sea level, and the main streets run east and west. With a north-easterly exposure, its climate is trying, but very bracing. The picturesqueness and variety of its several venerable ruins, its apparent isolation, its fine stretch of sands, and its three magnificent golf courses, have combined, along with the exceptional educational advantages it enjoys, to render it a favourite residential city. The legend attributing the founding of it to St. Regulus or Rule is too involved to bear serious examination. He had been directed in a vision to remove the relics of St. Andrew from Patras, in Achaia, Greece, where



ST. ALBANS CATHEDRAL.

[Photo: Cassell & Co.]

Heath, north of the city, on February 14th, 1461, when Margaret compelled the Earl of Warwick to retreat with considerable loss. Cardinal Wolsey became 38th abbot in 1521, and retained the office till his downfall. Pop. (1901), 16,019.

St. Aloysius (LUIGI GONZAGA, Marquis of Castiglione, 1568-91) renounced his marquisate and became a Jesuit in 1585. He devoted himself to the care of those sick of the plague in Rome, and died of the disease. He was canonised in 1726.

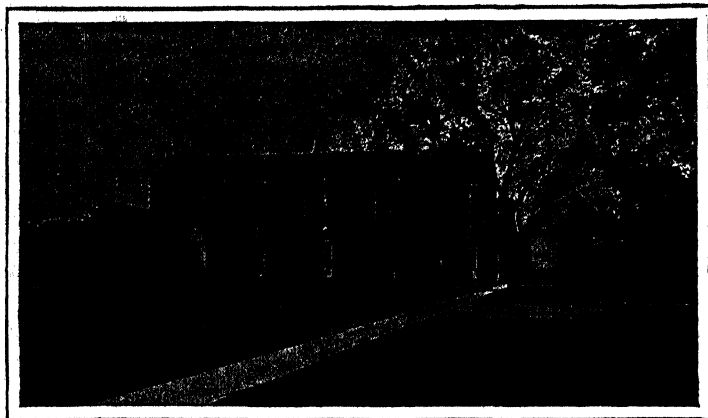
St. Andrew and other saints and patron saints. [See the various names.]

St. Andrews, a city and seaport of Fifeshire, Scotland, situated at the western extremity of St. Andrews Bay, on the North Sea, 11 miles

195—N.E.

they had lain since the martyrdom of the apostle about 70. The saint complied, and his ship being wrecked off the Fifeshire coast, he landed in 347, and dedicated the place to St. Andrew. Whatever be the truth of the tradition, which is of ancient origin, the ecclesiastical history of the city can be traced back to the 6th century, when a monastery (Kilrimont) was founded here by St. Kenneth. In the early part of the 10th century it was already the seat of the Scottish primate. The cathedral, the plan of which has been cut out in the turf, was one of the most imposing structures in Scotland. It was founded in 1159, but not completed till 1318, when its consecration was witnessed by Robert Bruce. It was despoiled by fanatics in 1559, and when the central tower collapsed, fifty years later, no steps were taken to rebuild it, its scanty remains standing gaunt

and weird, bare to the bitter nor'-east blast. Immediately adjoining it is the relic of the interesting Romanesque church of St. Regulus, believed by some antiquaries to be of Culdee origin, from the square tower of which, 108 feet in height, a grand panoramic view of the city and neighbourhood may be had. On a bold promontory, lashed by the waves, is all



MADRAS COLLEGE, ST. ANDREWS.

Bell; the Town Church (Holy Trinity) containing an elaborate monument to Archbishop Sharpe and the scene of the ministry of A. K. H. B., the Town Hall, the Gibson Memorial Hospital (1884), the University Library the New Medical Buildings, and the Club house of the Royal and Ancient Club, founded in 1754. Among the monuments are the obelisk to the Martyrs, near the Witch Hill, and the handsome fountain in memory of Whyte-Melville, the novelist. The only industry of importance is the deep-sea fishery. Pop. (1901) 7,619.

St.-Arnaud, ARMAND JACQUES LEROY DE, Marshal of France was born in Paris, on August 20th, 1801, and first entered the army in 1816. But after a short period he went upon the stage and remained an actor for ten years, re-entering the army in 1831. He aided in the suppression of the La Vendée insurrection, and spent many years in Algeria

that is left of the castle, built as an episcopal residence by Bishop Roger, about the beginning of the 13th century. It was so often captured by the English that it was destroyed in 1337 to save it from falling again into their hands. But it was rebuilt, and became for a period a royal residence. From its windows Cardinal David Beaton beheld George Wishart burning at the stake (March, 1546), and was himself slain within its walls in less than two months in revenge. The castle gradually fell into disrepair in the 17th century, and gradually became a mass of ruins (now well tended), of which the bottle dungeon is the most interesting. Other remains in the city are the beautiful fragment of the Blackfriars monastery (founded in 1274) and the Priory (founded early in the 12th century), on the partial restoration of which the third Marquis of Bute spent a large sum of money. The University, the oldest in Scotland, was founded in 1411, and consisted finally of St. Mary's College (1411), St. Salvator's College (1456), and St. Leonard's (1512). As remodelled St. Mary's was devoted to theology (1579), and in 1747 St. Salvator's and St. Leonard's were combined, the United Colleges occupying the premises of St. Salvator's, and those of St. Leonard's at last forming a high school for girls—St. Andrews having played the pioneer rôle in the higher education of women. In 1897 the University College of Dundee was affiliated to that of St. Andrews. Other prominent buildings are Madras College, opened in 1833, founded by Dr. Andrew

[Photo: Pictorial Agency.]

gaining a name for bravery, callousness, and no too great regard for scruple. The time for such a man was ripe, Louis Napoleon's designs on the government of France being now matured. He was promoted general and recalled to Paris. An expedition against the Kabyles was hurriedly decided on, and St.-Arnaud's success was deliberately exaggerated in the press as part of the Bonapartist game. The general was rewarded with the portfolio of war (October, 1851) and accordingly he carried out thoroughly the *coup d'état* (December, 1851). A year later he was made marshal and, on the outbreak of the Crimean war, entrusted with the French command. Soon after the battle of the Alma, in which he took part, his health suddenly broke down, and he died on board the *Berthollet*, on his way to France, on September 29th, 1854.

St. Asaph, a cathedral city of Wales, on the borders of Flintshire and Denbighshire, 5 miles N. of Denbigh. It is situated on an eminence in the Vale of Clwyd, near the junction of that river with the Elwy. St. Asaph was a disciple of St. Kentigern, or Mungo (d. 603), who is said to have been the actual founder of the see, during the period of his exile from Glasgow, whence he had been expelled by the Pictish king. The cathedral, which is the smallest in Great Britain, is mainly Decorated, with a central tower of 93 feet. Among the holders of the see were Geoffrey of Monmouth (d. 1154), Isaac Barrow (d. 1680), and Thomas Tanner (d. 1735). Near the city is the holy well of

Ffynon Fair. Felicia Dorothea Hemans (d. 1835), the poetess, resided at Bronwylla, and a memorial of her was erected in the south aisle of the cathedral. Pop. (1901), 1,788.

St. Augustine, capital of St. John's county, Florida, United States, on Matanzas Sound, 3 miles from the Atlantic and 36 miles S.E. of Jacksonville. The city is the oldest in the Union, having been settled by the Spaniards in 1565, and a house built by the Huguenots in the preceding year is still extant. Among the principal buildings are the Roman Catholic Cathedral, St. Joseph's Academy, and the Institute of Natural Science, while the city gate and Fort Marion (Fort of San Marco) are relics of former days. The city is one of the most fashionable winter resorts in the country, the temperature for that season being 55° F. Owing to the prevalence of the orange, citron, date, palmetto, and other sub-tropical trees and plants, the city wears an attractive appearance, which is enhanced by the quaint narrow streets and overhanging balconies. Pop. (1900), 4,272.

St. Austell, a town of Cornwall, England, not far from St. Austell Bay, an arm of the English Channel, 14 miles N.E. of Truro. It is the capital of the china-clay district. Since the chemical qualities of the clay and stone were not discovered till 1763, the town is comparatively modern. The chief buildings are Holy Trinity Church, constructed of Pentewan stone in the Early Decorated and Perpendicular styles, the town hall and market-house, built of granite, and the Assembly Rooms. The industries are concerned with the numerous tin and copper mines and china-clay works in the locality. Hundreds of thousands of tons of the clay are exported every year to the Potteries—where Josiah Wedgwood was the first to utilise it in the manufacture of the famous ware bearing his name—and the cotton-factories of Lancashire, where it was employed for loading the fabric with size, a species of adulteration that imperilled the English markets in several foreign countries. At the extremities of the northern and north-western boundaries of the parish are two large barrows—called "Cock's Barrow" and "Hen's Barrow"—about one mile apart from each other. The latter, 1,034 feet above the sea, is also known as the Archbeacon of Cornwall, and from its summit, on a clear day, the prospect embraces the whole of the county. Pop. (1901), 3,340.

St. Bees, a town on the coast of Cumberland, England, 4 miles S. of Whitehaven. The

Culdee nunnery, founded by St. Bega in the 7th century, having been destroyed by the Danes, a Benedictine priory was established here in the time of Henry I. The St. Bees Theological College, founded by Bishop Law in 1816 for the benefit of divinity students who were too poor to study at Oxford or Cambridge, was closed in 1897. The grammar school was founded in 1583. The town has some repute as a summer holiday resort. St. Bees Head, a bold promontory, 2½ miles to the north-west, is nearly 300 feet high, and carries a lighthouse the light of which is visible for 25 miles. Pop. (1901), 1,236.

St. Bernard, two Alpine passes on the confines of Switzerland and Italy. The Great St. Bernard (8,110 feet), now crossed by a road, is in the Pennine Alps, east of Mont Blanc, between Piedmont and the Swiss canton of Valais. Near its summit is the famous hospice, a substantial stone building, established by Bernard de Menthon (962) for the use of pilgrims to Rome. It is in the charge of a few Augustinian monks, who, assisted by attendants, rescue travellers with the aid of dogs. Napoleon crossed the Alps by this pass in May, 1800. The Little St. Bernard (7,180 feet above the level of the sea) is situated in the Graian Alps, south of Mont Blanc, between Piedmont and Savoy.

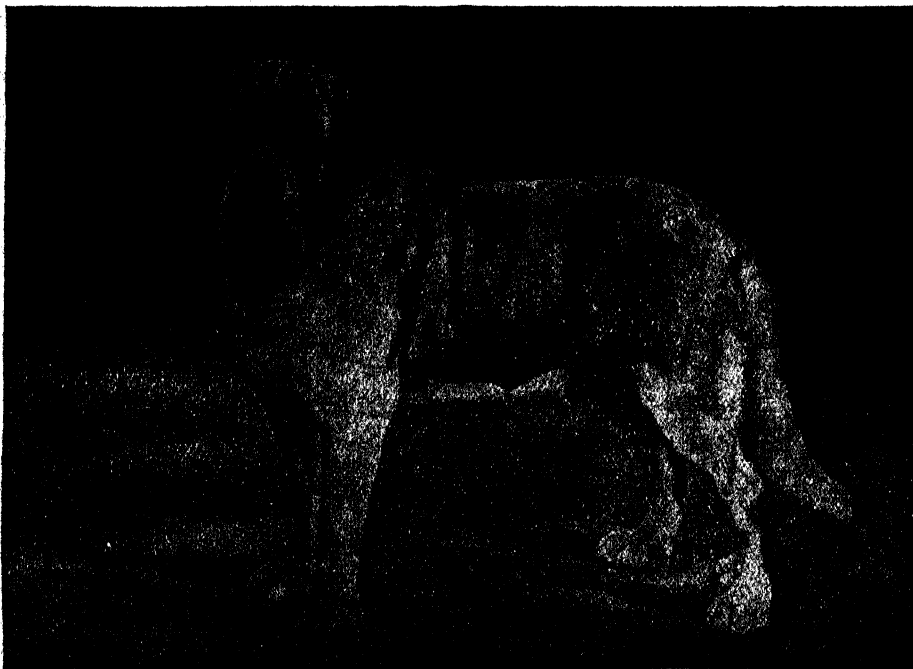


THE GREAT ST. BERNARD HOSPICE.

St. Bernard, a breed of large dogs deriving their name from the Augustinian hospice in the Great St. Bernard Pass, where they were employed as guides by the monks in their journeys to the foot of the pass on each side to assist travellers on their way. Every animal carried around its neck a little barrel

of brandy to revive the lost wayfarer. Some of the sagacious creatures, like "Barry I." and "Barry II.," acquired worldwide fame for the number of lives they had been the means of saving. The breed is said to have sprung from a mastiff and a Danish bull-bitch, though the date is uncertain. This breed, however, was kept pure at the hospice for a long period; now they seem to be dying out. It was stated in March, 1894, that there were only five at the hospice in the early part of that

from the Welsh bishop St. Briocus, who conducted missionary labours here in the 5th century. It contains many picturesque, old-fashioned houses. Among the chief buildings are the 13th-century cathedral, the church of Notre Dame d'Espérance, the hospital (once a Capuchin monastery), the lycée (formerly a monastery of the Cordeliers), the palais de justice, the Museum of Archæology and Natural History, the episcopal palace, and the town-house. A statue of Duguesclin adorns the



MESSES. SCOTT AND KOSTIN'S SMOOTH ST. BERNARD CHAMPION "THE VIKING."

(From the original painting by Lillian Cheviot.)

year, but they have been reinforced, if not replaced, by Newfoundland stock. About 1860 St. Bernards were introduced into England, and soon became very popular, although specimens had been introduced long before that date, some of Sir Edwin Landseer's earliest paintings having been studied from life in 1817 and 1820. The general coloration is orange, red, or fawn, with a good deal of white. There are two varieties, one with a rough, the other with a smooth coat.

St. Brienc, a town of the department of Côtes-du-Nord, Brittany, France, 36 miles W. by S. of St. Malo. It is situated two miles from the English Channel, where its port is Légué, on the left bank of the Gouet. It was named

boulevards which replaced the ramparts. The inhabitants are largely employed in the nurseries and quarries of blue granite, and also in the fisheries. Dairy produce is despatched in considerable quantities to England and fish and game to Paris. Pop. (1901), 22,198.

St. Chamond, a town of the department of Loire, France, on the Gier, a tributary of the Rhône, 7 miles N.E. of St. Étienne. It was founded in the 7th century by St. Ennemond or Chamond, Archbishop of Lyons. The manufactures comprise silks, ribbons, and laces, besides iron-founding and dyeing, while the coal mines in the vicinity are an important industry. Pop. (1901), 15,469.

St. Christopher, or **St. Kitts**, an island of the Lesser Antilles, forming, with the islands of Nevis and Anguilla, one of the five presidencies into which the group of the Leeward Islands of the British West Indies is divided. It has an area of 65 square miles. When discovered by Columbus, in 1493, it was densely inhabited by Caribs. About 1623 it was simultaneously occupied by French and English settlers, between whom there was frequent friction until in 1713 it was ceded to Great Britain. From north to south it is traversed by a mountain range, of which the highest point is Mount Misery (4,100 feet). The climate is dry and healthy and the rich soil is well adapted for sugar plantations, which furnish the staple industry. The capital is Basseterre (9,962). Pop. (1901), 29,782.

St. Cloud, a town of the department of Seine-et-Oise, France, 4 miles W. of Paris. The château built by the Duke of Orleans, brother of Louis XIV., afterwards became a royal palace, and was occupied by Napoleon. It was destroyed during the second siege of Paris (1870). The park still retains much of its beauty and grandeur and is one of the favourite sylvan retreats near the capital. Within its bounds is held a great fair every September which lasts for three weeks, and the famous Sèvres porcelain manufactory is situated in its precincts. Clodoald or Cloud was the grandson of Clovis and adopted the monastic life. Peter the Great was received at the château, which became the favourite residence of Napoleon. The capitulation of Paris was signed here in 1815, and hence in 1830 emanated the orders which brought about the fall of the Bourbons. Pop. of commune (1901), 7,200.

St. Davids, a city of Pembrokeshire, Wales, 14 miles W.N.W. of Haverfordwest. It is situated on the Alan, in a barren, rocky plain, about 1½ mile north of the shore of St. Bride's Bay. Its existence is due to St. David, who, in the 6th century, transferred hither the archiepiscopal see of Caerleon. The cathedral, a cruciform Transitional structure, was begun in 1176. The most noteworthy features are the richly-ornamented nave, which has a fretted timber roof, the beautiful 14th-century stone rood-screen, the carved choir stalls, the tomb of Edmund, Earl of Richmond, father of Henry VII., and the shrine of St. David. The ruins of St. Mary's College (1377) are picturesque, and Bishop Gower's palace (1342) is a remarkably fine example of mediæval domestic architecture. Some fragments of ancient wall on the coast are said to mark the site of the Roman station of Menapia—the Welsh Menyw or Mynyw,—represented by the modern Menapia, a name still applied to the see. Pop. (1901), 1,710.

St. Davids Head, the most westerly point of Wales, a bold precipice, 3 miles N.W. of St. Davids, Pembrokeshire. On the sum-

mit is a mass of rugged rocks of fantastic shape. A cromlech is remarkable in that the table stone is supported by a single upright stone. At the southern base of the Head lies the famous Logan Stone, a huge block, which was once so delicately poised that it would answer to the slightest pressure. The equilibrium being destroyed on a certain day in the 17th century, the stone was dislodged and never afterwards replaced. In the clefts of the precipitous cliffs a crystal is found called "St. Davids Diamond," somewhat resembling an amethyst, but, owing to its extreme hardness, susceptible of a greater degree of polish than most of the British gems.

St. Denis, a town of the department of Seine, France, on the right bank of the Seine, 5 miles N. of Paris. The abbey, built by Dagobert in the 7th century on the site of an old chapel which marked the resting-place of St. Denis, became the place of burial for the French sovereigns. At the Revolution (1793) the church was sacked, the tombs were violated and many objects of unique interest were stolen or lost. Louis XVIII. recovered as many of them as he could and replaced them. The existing structure, begun by the Abbé Suger, was restored by Viollet-le-Duc in 1848 and the following years, and is now one of the grandest examples of the Gothic style in the country. The manufactures are varied, including machinery, boats, chemicals, beer, leather, flour, candles, and railway carriages. On November 10th, 1567, a bloody battle was fought in the vicinity between the Huguenots and Roman Catholics. The latter were victorious, but lost their leader, the Constable Anne de Montmorency. Pop. (1901), 60,808.

St. Dié, a town of the department of Vosges, France, on the right bank of the Meurthe, 45 miles S.E. of Nancy. It commands a magnificent view of the Vosges mountains and is a convenient centre for excursions. It grew around the monastery founded in the 6th century by St. Deodatus (whence its name) of Nevers, which became a chapter of canons four hundred years later. Among its provosts or deans were Giovanni de' Medici (afterwards Pope Leo X.) and several princes of Lorraine. Not till the establishment of a town council in 1628 were its excessive privileges reduced, and it was abolished during the Revolution. When Alsace was annexed by Germany in 1871, many manufacturers transferred their factories and works to St. Dié, to the increase of its prosperity. It has weaving factories, bleachfields, hosiery mills, engineering shops, tile works and breweries. The principal buildings include the cathedral with a Romanesque nave and Gothic choir, the Romanesque church of Notre Dame, the town hall, library, and natural history museum. Pop. (1901), 21,480.

St. Dizier, a town of the department of Haute-Marne, France, 35 miles S.E. of Châlons-sur-Marne. It has a public library and museum.

and foundries of iron, steel, copper and bronze, besides boatbuilding and engineering works. Pop. (1901), 14,601.

Ste.-Beuve, CHARLES AUGUSTIN DE, critic, was born at Boulogne-sur-Mer, France, on December 23rd, 1804. On his mother's side he was of English descent, and this accounts for his early attraction to English literature. At the age of 14 he was sent first to the Collège Charlemagne, and then to the Collège Bourbon, at Paris, to finish his education, and, after studying medicine, followed the profession of a doctor for a time; but a love for literature and some chance contributions of his to the papers induced him to abandon medicine. He joined the romantic movement after reading Victor Hugo's poems, which impressed him greatly. In 1828 appeared his first work, *Tableau Historique et Critique de la Poésie Française et du Théâtre Français au XVI. Siècle*, originally contributed to the *Liberal Globe*, a work which he somewhat enlarged in later years. He published a volume of poems, *Vie, Poésies et Pensées*, in 1829, over the pseudonym of "Joseph Delorme," but the second collection of poems, *Les Consolations* (1830), showed higher qualities. About this time he began to write for the leading periodicals, and started his admirable *Portraits Littéraires*, which were followed several years later by his still more remarkable *Causeries du Lundi*, which came out every Monday in *Le Constitutionnel* newspaper, and proved him one of the finest of critics. To full knowledge of his subjects were added an inimitable style and exquisite critical discernment. In 1840 he obtained from M. Cousin the post of keeper of the Mazarin Library, and in 1844 he entered the Academy, in succession to Casimir Delavigne, being received next year by Victor Hugo. He supported the Government after the *coup d'état* of 1851 and received the appointment of professor of Latin poetry at the Collège de France, but the students resenting his conversion to monarchism refused to hear him and he was obliged to accept a similar position at the École Normale. Napoleon III. made him a senator in 1865. He died in Paris on October 13th, 1869. His works are not numerous in one sense, though they fill many volumes. The *Causeries* occupy about twenty of them and other works of his deserving of mention are the *Histoire de Port Royal* (1840-62), *Portraits de Femmes* (1844), and *Portraits Contemporains* (1846). His *Poésies Complètes* appeared in 1840. He wrote numberless prefaces and introductory essays.

Ste.-Claire Deville, HENRI ÉTIENNE, chemist, was born at St. Thomas, an island of the Antilles, West Indies, of French parents, on March 11th, 1818, and was educated in Paris. From an early period he devoted himself to patient chemical research, and, after taking his degrees of doctor of medicine and of science, became professor of chemistry at

Besançon in 1845. He was appointed examiner at the École Normale de Paris in 1851, and in 1853 published a new system of mineral analysis. He succeeded Dumas at the Sorbonne in 1859, was elected member of the Academy of Sciences in 1861, and died at Boulogne-sur-Seine on July 1st, 1881. He was especially notable in mineral chemistry. He discovered the properties of composite nitric acid, and simplified the extraction of aluminium. He obtained the Legion of Honour in 1855.

St. Elmo's Fire, the name given by sailors to a faint flame or glow sometimes seen at the tips of masts and spars in thundery weather. It is due to the dissipation of atmospheric electricity in the form of a brush discharge. The origin of the name is a puzzle. Some writers sought its solution in Greek mythology. Castor and Pollux were the patrons of navigation. Once the ship *Argo* encountered a violent tempest, during which the two divinities were seen with flames of fire playing around their heads, whereupon the sea fell and the storm was quelled. It has therefore been suggested that Elmo was a corruption of Helena—fair Helen of Troy—the sister of Castor and Pollux. Greek and other sailors looked upon the phenomenon as of happy omen. Others derive the name from Elmo, an Italianised form of St. Erasmus, a Syrian martyr-bishop of the 3rd century.

Saintes, a town of the department of Charente-Inférieure, France, on the left bank of the Charente, 40 miles S.E. of La Rochelle. Its Roman remains are of great interest, the amphitheatre especially being only inferior in area to the Colosseum. The site of the well-preserved triumphal arch of Germanicus has been altered, but the monument was rebuilt stone by stone. The principal buildings include the cathedral of St. Peter, with a tower 236 feet high; the church of Eutropius, founded in the 6th century and rebuilt in the 11th, with an extremely large, well-lighted crypt; Notre Dame, an exceptionally fine edifice of the 11th and 12th centuries, which has been secularised; the antiquarian museum, unusually rich in examples; the palais de justice; the Renaissance town-house and the library. The industries include iron- and copper-founding, coopering, skin-dressing and the making of agricultural implements. Saintes (Latin Mediolanum) took its name from the Gallic tribe of Santones, whose chief town it was. Christianity was introduced in the 3rd century by Eutropius, its first bishop. Richard Cœur de Lion fortified himself here against his father, Henry II., who captured the town after a severe siege. Bernard Palissy carried on the craft of potter in Saintes for many years. Pop. (1901), 18,218.

St. Étienne, capital of the department of Loire, France, on the Furens, an affluent of the Loire, 33 miles S.W. of Lyons. The manufacture of ribbons (mostly hand-made) and other

silk articles gives employment to about 80,000 workers. More than 20,000 hands are engaged in the manufacture of steel and iron plates, firearms (especially at the national gun-factory), cutlery, and other metal wares. The number of persons at work on the neighbouring coal-beds is estimated at 17,000. Other manufactures embrace hardware, locks, files, nails, bolts, anvils, vices, pottery, hemp cables and lime. Among the public buildings are the town hall, Palais des Arts, School of Mines. It is of interest to note that the first railways constructed in France were those from St Étienne to Andrezieu (1828) and to Lyons (1831). Pop. (1901), 139,350.

St. Évremond, CHARLES MARGUETEL DE ST. DENIS, SEIGNEUR DE, soldier, poet and essayist, was born at Saint Denis-le-Gast, in the department of Manche, France, on April 1st, 1613. He was educated at Paris, and Caen, and studied for the law, which he finally gave up for a military career. He entered the army, serving throughout a great part of the Thirty Years' War, and being engaged at Rocroi (1643), Friedburg (1644), and Nordlingen (1645), where he was wounded. He was as witty as he was brave, and a few shafts of satire against the Prince Condé (1648), by whose side he had fought, and with whom he had been on terms of friendship, caused his disgrace. He lost his commission and was kept in the Bastille for three months (1653), fleeing to England in 1661 to escape a second detention. He attached himself to the *salon* of the Duchess of Mazarin, and was one of the chief ornaments of Charles II.'s court. He died in London on September 29th, 1703, and was buried in Westminster Abbey. His works were circulated in manuscript during his lifetime and it was only in 1705 that the first authentic edition was published (in London). Among his most characteristic were the *Comédie des Académiciens* (1644), a skit on the young Academy, *Sir Politick Would-be*, and *Conversation du Maréchal d'Hocquincourt avec le Père Canaye*. He was master of a polished style, lit up with subtle satire, and as a critic was singularly sane for his surroundings.

St. Gall, a canton in the north-east of Switzerland, bounded on the N. by Lake Constance and Thurgau, on the E. by Vorarlberg (Austria), on the S. by Grisons and Glarus, and on the W. by Schwyz and Zürich. It occupies an area of 779 square miles, and completely surrounds the canton of Appenzell. The surface is hilly, in parts even mountainous, some of its Alpine summits reaching an altitude of 10,000 feet. The embroidery of cottons and muslins forms the chief industry. The mineral waters of the spas of Ragatz and Pfäfers are in high esteem. The inhabitants speak German, and the majority are Roman Catholic. The state takes its name from St. Gallus, who carried on his missionary work in the country early in the 7th century. The canton was constituted in 1803, and St. Gall is its capital. Pop. (1900), 250,285.

St. Gall, capital of the preceding canton, Switzerland, on the Steinach, at an altitude of 2,200 feet, 7 miles S.W. of Rorschach, on Lake Constance. It grew up between the 8th and the 10th centuries round the Benedictine monastery which marked the site of the hermitage of St. Gall, a disciple of St. Columban who established himself here in 614. During the Middle Ages the monks became famous for their learning, their love of music, and, above all, their zeal in collecting MSS. It is to their care alone that we are indebted for our knowledge of Quintilian and other classical authors. The monastic library is still preserved in the ancient buildings, which have been converted into government offices and schools. The abbey church was restored in the 18th century, and there is a town library dating from 1536. St. Gall became the seat of a bishop in 1836. The principal manufactures are woollen, cotton and linen goods, embroideries, lace, muslins, and prints. Pop. (1900), 33,116.

St. George's Channel, the reach of sea between Wales and Ireland, connecting the Atlantic with the Irish Sea on the south as the North Channel connects it on the north. The Channel extends in a north-north-easterly and south-south-westerly direction for fully 100 miles, with an average breadth of 56 miles. The greatest distance across, from Aberystwith to Cahore Point, is 90 miles, and the shortest, from St. Davids Head to Carnsore Point, 50 miles. From Fishguard to Rosslare there is a daily express service, inaugurated in 1906 by the Great Western Railway Company. The area of the Channel is estimated at 5,600 square miles, of which Cardigan Bay occupies about one-sixth. The floor of the Channel consists principally of sand and gravel, and there are numerous sand-banks off the Irish shore. In mid-Channel the current running towards the north-east frequently impedes navigation, and in tempestuous weather is apt to drive shipping on to the iron-bound coast of Wales.

St. Germain-en-Laye, a town of the department of Seine-et-Oise, France, on the left bank of the Seine, 10 miles W.N.W. of Paris. The royal castle, rebuilt by Francis I., was the chief residence of the French kings prior to the reign of Louis XIV., when the court was established at Versailles, Louis, it is said, being anxious to remove out of sight of the towers of the abbey of St. Denis, where he would be buried. James II. resided and died (1701) here after his flight from England. After being used as a barracks and a military prison, the palace was converted by Napoleon III. into a museum for Celtic antiquities. The forest of St. Germain covers about 10,000 acres. The noble terrace, 1½ mile long and 100 feet wide, constructed by Le Nôtre in 1672, commands a beautiful view of the valley of the river and its vine-clad slopes. In the church of St. Germain is a mausoleum, erected by Queen Victoria to the memory of James II. of England. In one of

the squares is a statue to Thiers, who died here on September 3rd, 1877. Pop. (1901), 17,300.

St. Gotthard, a group of mountains in the Lepontine Alps, Switzerland, between the cantons of Uri and Ticino, some of the peaks of which exceed 10,000 feet in height. The St. Gotthard pass (6,936 feet), on the route from Flüelen to Bellinzona, has a hospice for travellers 69 feet below the summit. The road over the pass was improved in 1820-24. The St. Gotthard is now pierced by a railway tunnel (constructed 1872-80), which extends from Göschenen to Airolo, a distance of over 9 miles.

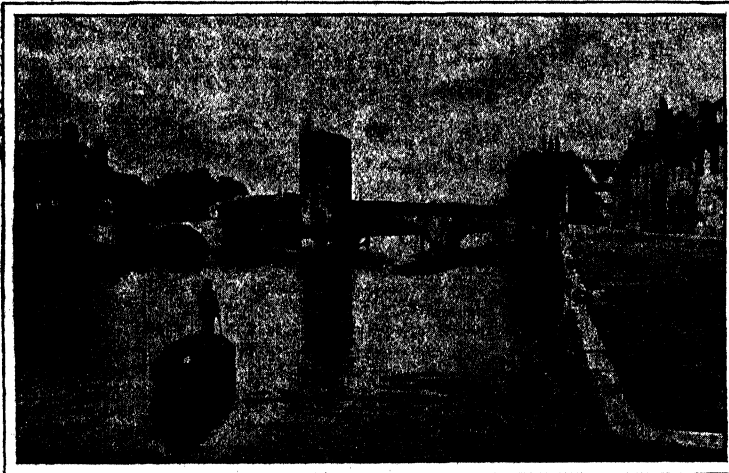
St. Helena (usually pronounced St. Helēna), an island of the South Atlantic, in 15° 56' S. and 5° 43' W., 1,200 miles from the West Coast of Africa. It is 10½ miles long from east to west, and 7 miles broad, and has an area of 47 square miles. The cliffs rise to a lofty table-land, the highest point on which is 2,823 feet above the sea. Jamestown, the capital, is situated in a ravine sloping down to the north-west coast. The climate is healthy, the mean temperature being 62° F. Whale-fishing and potato-growing are the principal occupations of the inhabitants. The affairs of the island are administered by a governor and an executive council. Since the construction of the Suez Canal it has ceased to be a port of call for eastward-bound vessels, and its prosperity has greatly declined. The island was discovered by the Portuguese in 1502, and in 1651 annexed by the East India Company,

he died. The island was used in 1900 as a place for the reception of Boer prisoners of war. General Sir William Butler said the deported Dutch farmers never tired of looking at the bust. The garrison was withdrawn from the island in 1906. Pop. (1904), 3,882.

St. Helens, a town of Lancashire, England, 12 miles E.N.E. of Liverpool. The town hall has a clock-tower 130 feet high, and in a niche above one of the windows is a figure of St. Helen, patron saint of the borough. The town is the headquarters of the crown-, sheet-, and plate-glass industry, flint-glass and bottles being also made. It has, besides, chemical and copper-smelting works, iron and brass foundries, potteries, and several collieries. Brewing is also carried on, and watch movements are made. Victoria Park and Taylor Park are nicely laid out grounds. Within the second half of the 19th century it grew from a village to a large and populous town. Pop. (1901), 84,410.

St. Helier, the capital of Jersey, Channel Islands, pleasantly situated on St. Aubin's Bay on the south side of the island. It is protected by Fort Regent (1806-15), which stands on a height on the east side of the harbour, and by Elizabeth Castle (1551-86), built on a rock which is connected with the shore by a causeway. The principal buildings are the Cohue, or Royal Court House, containing a portrait of Major Pierson, who fell in the battle of Jersey, which was fought hard by after the landing of the French in 1781; the Public Library, erected

in 1736 by Philip Falle, a chaplain to William III.; the Gothic parish church, dating from 1341, but restored; Victoria College, a public school of some consequence, built in 1850-2 as a memorial of Queen Victoria's visit in 1846, and the Hospital. The port has good harbour accommodation, protected by Hermitage breakwater, and carries on a considerable trade. During the early potato season, when the island-labour is strengthened by Breton peasants, it presents an extremely animated appearance. A marine biological station was opened in 1893. Pop. (1901), 27,866.



ST. IVES BRIDGE.

by which it was administered until 1834. Longwood, the residence of Napoleon from 1815 to 1821, is in the north, three miles from Jamestown. A bust of the Emperor stands on a pedestal at the spot in the little room where

St. Hilaire. [BARTHÉLEMY; GEOFFROY.]

St. Ives, a town of Huntingdonshire, England, on the left bank of the Ouse, 5 miles E. of Huntingdon. It was originally called Slepe,

but is said to have received its present name in memory of a Persian bishop, Ivo, who died here about the end of the 6th century. The church of St. James is an interesting Norman and Early English edifice. The Ouse is crossed by a beautiful bridge, built by the abbots of Ramsey. It consists of six arches, and near the centre, over one of the piers, stands an ancient tower-like structure, the lower part of which was once used as a chapel, but is now a dwelling-house. The streets adjoining the river are liable to destructive floods. Among the charities is one for the distribution of Bibles, subject to the condition that six boys and six girls shall cast dice for the Bibles in church during divine

leper hospital, dedicated to St. James the Less, occupied the site, but the support of a few friars out of the funds made it a religious house. On the dissolution of the religious houses, Henry VIII. appropriated the site and replaced the hospital with a palace, the grounds of which were combined with Whitehall, as a residence for Anne Boleyn. After the fire at Whitehall Palace in 1697 the Court was removed to St. James's. Levees are still held here, but Drawing-rooms have been transferred to Buckingham Palace. The quaint gate-house with its little turrets was designed by Hans Holbein, but the buildings (largely added to since his time) are of a nondescript character, comprising the



ST. JAMES'S PALACE.

service. Oliver Cromwell resided at Slepe Hall. Pop. (1901), 2,910.

St. Ives, a town on the north coast of Cornwall, England, 8 miles N.N.E. of Penzance. The pier was built by John Smeaton in 1770. Most of the inhabitants are engaged in the pilchard and mackerel fisheries. Some boatbuilding is carried on, besides manufactures of sails and nets. Pop. (1901), 6,697.

St. James's Palace, an old-fashioned, red-brick building situated at the south-western end of Pall Mall, London, with a front to St. James's Park. In spite of its shabby and dingy appearance, however, it is the seat of the Court of St. James's (not St. James, as it is sometimes erroneously printed). In the 12th century a

Chapel Royal, offices of several members of the Royal Household, and dwellings assigned to friends of the Sovereign. Charles II., George IV., and the Old Pretender were born in the Palace, and hence Charles I. walked to the scaffold at Whitehall. The Sovereign is proclaimed in Colour Court, and in the Chapel Royal Queen Victoria was married (February 10th, 1840). The adjoining St. James's Park covers about 60 acres, and is well laid out in trees and shrubbery. In the centre is an ornamental sheet of water, where Charles II. used to feed the ducks. At the east end are the Horse Guards, the Foreign Office, Admiralty, and other Government offices. At the west end are Buckingham Palace and the National Monument to Queen Victoria. On the north side extends the Mall, considerably

altered in 1907, and on the south side are Birdcage Walk (so named from the cages that used to be suspended from the trees for the delectation of the Merry Monarch) and Wellington Barracks. A speciality is made at the park of breeding water-fowl, including such rarer kinds as pelicans.

St. John, capital of St. John county, and the largest city in the province of New Brunswick, Dominion of Canada, situated at the mouth of the St. John river, 53 miles S.E. of Fredericton. The harbour is safe and commodious, being the only Atlantic port north of Baltimore that is ice-free. St. John has a large timber trade, and shipbuilding is an important industry. The manufactures include steam-engines, iron-castings, agricultural implements, boots and shoes, etc., and the fisheries, especially of salmon, shad, halibut, haddock, and herrings, employ hundreds of men. The city has several times been devastated by fire, and in the conflagration of June 20th, 1877, was nearly half destroyed. Pop. (1901), 40,711.

St. John, HENRY. [BOLINGBROKE.]

St. John, KNIGHTS OF. [HOSPITALLERS.]

St. John's Bread. [CAROB.]

St. John's-wort, the popular name for most members of the genus *Hypericum*, the type of the thalamifloral order *Hypericaceæ*. They may be shrubby or herbaceous, and have opposite and decussate simple leaves, often dotted with glands; yellow, pentamerous, polysymmetric flowers, with triadelphous or polyadelphous stamens originating in branching; and a capsular fruit with distinct styles (generally tricarpestry). Once considered a remedy for epilepsy, St. John's-wort came to be looked upon as a charm against evil spirits, and to be used in rustic divination. It is named from the fact that it flowers about the time of the feast of the nativity of St. John the Baptist (June 24th).

St. John's, the capital of Newfoundland, on the north-east coast of the peninsula of Avalon, which projects from the south-east of the island, 1,700 miles W. by S. of Queenstown, Ireland. The city is grandly situated, rising boldly from its fortified and landlocked harbour, which is approached through the Narrows. The principal buildings include Government House, Colonial Building (Parliament House), the Athenæum, St. Bonaventure College, and the Roman Catholic Cathedral. The industries are largely connected with the refining of seal-oil and the fisheries, but it has iron foundries and machine shops, breweries, distilleries, tanneries, boot and shoe factories, soap works, roperies, furniture factories, and cod-liver oil refineries. It is a point of departure for the whale and seal fisheries. It is probably the earliest English settlement in America. During a fire in 1892 nearly half of the town was destroyed. Pop. (1901), 29,594.

Saint Joseph, capital of Buchanan county, Missouri, United States, on the left bank of the Missouri, 63 miles N.N.W. of Kansas City. Among the principal buildings are the city hall, court-house, library, and several educational and charitable institutions. The manufactures include cotton and woollen goods, clothing, boots and shoes, leather goods, and foundry products, in addition to slaughtering and meat-packing, which constitute the leading industry. A fish-hatchery is in operation. The growth of the city has been remarkable. In 1870 the population numbered 19,565; by 1900 it had grown to 102,979.

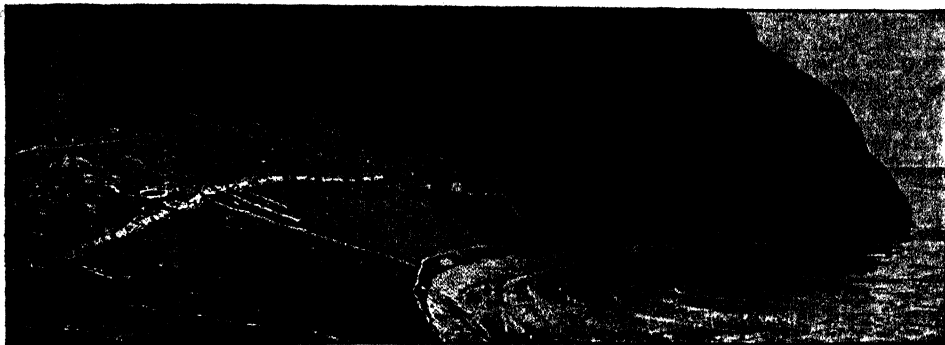
St.-Just, LOUIS ANTOINE LÉON DE, revolutionist, was born at Decize, in the department of Nièvre, France, on August 25th, 1757, and studied law for a while, eventually turning his attention to literature, and writing various poems from which decency is always absent. During the Revolution he rose rapidly to prominence, and became one of Robespierre's most sanguinary associates. Indeed, it is now believed that Robespierre's cruelty was largely the result of St.-Just's bloodthirsty inclinations. He was a fanatic and hesitated at nothing. He strongly advocated the execution of Louis XVI., and voted for the destruction of the Girondists. In Alsace, to which he had been sent as commissioner, his ferocity was equally marked. He was guillotined in Paris at the same time as Robespierre, on July 28th, 1794.

St. Keyne, or ST. KEAN, a village of Cornwall, England, on the Looe, 2 miles S. of Liskeard. The parish church stands on a hill, and from the summit of its tower may be seen the Eddystone Lighthouse, 18 miles distant. About a mile from the church is the famous well of whose waters tradition saith that whichever of a newly-wedded couple first drinks will secure and retain the supremacy throughout married life. Robert Southey made the legend the subject of a poem. Robert Scott was rector of the parish from 1840 to 1850, and wrote much of Liddell and Scott's *Greek-English Lexicon* here. St. Keyne, a pious British virgin of blood royal, flourished about 490. Pop., 132.

St. Kilda, an island in the North Atlantic, an outlier of the Outer Hebrides, belonging to Inverness-shire, Scotland. It measures fully three miles from north to south, less than two from east to west, and covers an area of about two square miles. Conagher, the highest hill, is 1,220 feet above sea-level, and is a sheer precipice, the loftiest in the British Isles. Excepting at the landing-place on the south-eastern shore, the cliffs are precipitous, the haunts of innumerable sea-birds, of which the most common are fulmar petrels, puffins, and solan geese, in the snaring of which the men prove themselves daring climbers. When Richard Kearton visited the island in 1896, he identified twenty-seven different kinds of birds. He inclined to the opinion that the St. Kildan wren is a distinct species. The inhabitants cultivate potatoes,

oats, and barley, on some 40 acres of good soil. There is pasturage for a thousand sheep and a few score West Highland cattle. On the isle of Soa, hard by, is a breed of small brown sheep, which, so Kearton was informed, are peculiar to this island and are descended from a few left, perhaps 800 years ago, by some Vikings who had called in for fresh water. Coarse tweed and blanketing are woven for home use. Gaelic is

is called St. Mary's, between Lakes Huron and Erie the St. Clair and Detroit, between Lakes Erie and Ontario the Niagara, and between Lake Ontario and the Atlantic the St. Lawrence proper. For nearly half its course the St. Lawrence varies in width from 1 mile or under to 3 or 4 miles, but about 400 miles above the Gulf it begins to expand into a broad estuary, the distance between the banks at the mouth



PANORAMIC VIEW OF ST. KILDA.

the only language. Neither crime nor drunkenness is known. The natives call the island Hirta ("the western land"). It was the scene of the incarceration of Lady Grange by her husband from 1734 to 1742. Having belonged to the Macleods from time immemorial, it was sold in 1779, but bought back in 1871. The attempt to deport the natives—out of pity for their supposed hard lot—to Australia in 1856 was stultified by the return of the emigrants. Ships' boats touching at the island communicate what is called "strangers' cold"; but the "eight-day sickness," formerly a terrible scourge (since it was the exception and not the rule for an infant to survive its eighth day), has yielded to treatment; the use of antiseptics and the practice of some regard for sanitation having almost stamped it out. There is a mail service a few times every year, but during about nine months out of the twelve the natives are without news of the world's doings. Pop., 80.

St. Kitts. [ST. CHRISTOPHER.]

St. Lawrence, a great river of North America which flows about 750 miles in a north-easterly direction from Lake Ontario to the Gulf of St. Lawrence. In a wider and more usual sense the name embraces the whole chain of great lakes (Superior, Michigan, Huron, Erie, Ontario), with the rivers between them up to the springs of the river St. Louis in the Mesaba range of mountains in Minnesota, the ultimate source of this enormous mass of fresh water, which has, thus regarded, a total length of 2,200 miles and a drainage basin of 500,000 square miles. Between Lakes Superior and Huron the stream

being over 100 miles. Some of the broader parts of the upper river are studded with numerous islands, and a long stretch immediately below Lake Ontario, called the "Lake of the Thousand Isles," is famous for its beautiful scenery. The channel was widened and deepened in 1858, so as to afford access for vessels of 4,000 tons to Montreal, 600 miles above the mouth. The chief tributaries are the Ottawa and the Richelieu. The great lakes and the river to the point where it crosses the parallel of 45° N. form the boundary between Canada and the United States. Jacques Cartier ascended the stream in 1535-6 as far as the site of Montreal. On August 30th, 1907, the huge bridge on the cantilever principle, then in course of erection across the river seven miles above Quebec, collapsed with a loss of at least 80 lives, all workmen. The Gulf of St. LAWRENCE, into which the river flows, lies between Labrador on the N., Lower Canada on the W., New Brunswick on the S.W., Nova Scotia and Cape Breton Island on the S., and Newfoundland on the E. Its length from north to south is about 300 miles, and its breadth about 240 miles. It communicates with the ocean by the Strait of Belle Isle to the north of Newfoundland, Cabot Strait dividing Newfoundland from Cape Breton Island and the Gut of Canso between Cape Breton Island and Nova Scotia.

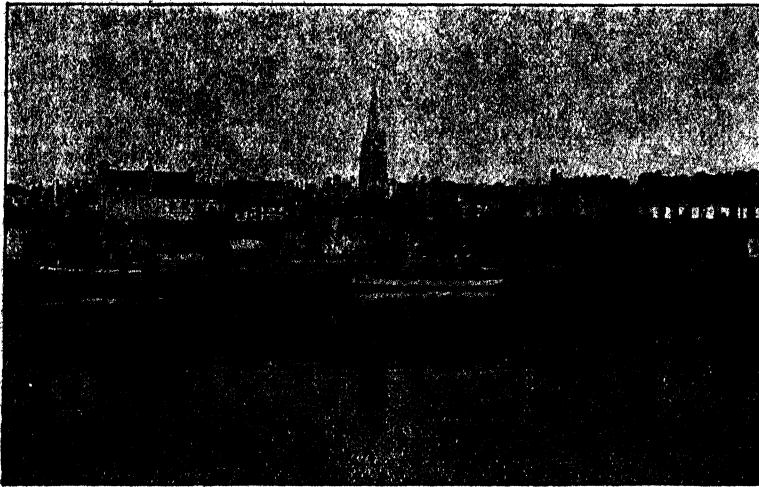
St. Leonards-on-Sea, a fashionable watering-place on the coast of Sussex, England, 54 miles S. by E. of London. Although lying immediately to the west of Hastings and forming an integral part of the borough, the

AB ST JUNG R.

character and appearance of the two places are so dissimilar that, in spite of their actual contiguity, they look like separate towns. Hastings is ancient, St. Leonards is scarcely older than the first Reform Act. The only relic of antiquity it possesses is the huge block of undressed stone which lies in a small enclosed garden on the parade, and which, according to tradition, was used by William the Conqueror as a dining-table on the day he landed at Bulverhythe, some two miles westwards. The front is spacious and handsome. The principal buildings are the Victoria Hotel, and, behind it, what was formerly the Assembly Rooms—the two being the nucleus round which the fashionable quarter grew; the parish church off the Marina, and the great houses of Warrior Square. It is unfortunate that the arch which once crossed the front towards the boundary-line between Hast-

by Geoffrey Plantagenet, but welcomed Philip Augustus in 1203. Taken by the English under Edward III. and again in 1417, it was permanently attached to France in 1450. It suffered for its adhesion to the Reformation, and when the Edict of Nantes was revoked many of its people emigrated. Leverrier, the astronomer, was born here in 1811, and is commemorated by a bust which has for a pedestal the Torigny Marble, marking the site where the Gauls held their assemblies in the Roman period. The chief buildings are the cathedral of Notre Dame (14th century), the picture gallery, and the abbey of St. Croix. Weaving, spinning, and tanning are the main industries. Pop. (1901), 10,329.

St. Louis, a city in the State of Missouri, United States, on the right bank of the Mississippi, 20 miles below its confluence with the



ST. MALO.

[Phot.: Neurdein, Paris.]

ings and St. Leonards (the site now marked by a block of red granite) was removed, for it was quaint and was not an obstacle. The public spaces include the romantic gardens at Maze Hill and Gensing Gardens, besides the promenade pier. In picturesque country, two miles to the south, stands Hollington Church, the beautiful little "church in the wood" referred to in one of Charles Lamb's letters. Pop. (1901), 26,872.

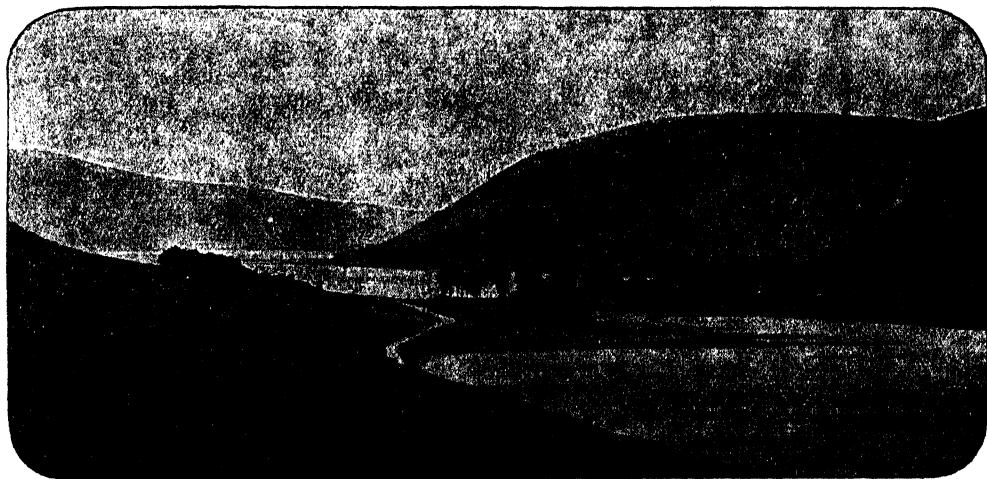
St. Ló, a town in the department of Manche, France, on the right bank of the Vire, 16 miles S. of the river's mouth in the English Channel, and the same distance E. by N. of Coutances. Originally called Briovira (Bridge of Vire), it received its present name from Bishop Ló, or Laudus, who flourished in the 6th century. Sacked by the Normans, it was captured in 1141

Missouri. It ranks fourth in the Union in point of population, and forms an important commercial centre. The city is built on three terraces, beyond the highest of which extends a broad plain, four miles from the river and 200 feet above its level. Its river frontage is 20 miles, several miles of which are occupied by wharves. The newer part consists of broad straight streets, but the public buildings, though massive and solid, are not remarkable for the beauty of their architecture; the city hall, law courts, the county court-house, the custom-house, chamber of commerce, art gallery, Coliseum, and the post-office are the most important. The city contains two universities (the Washington and the St. Louis), besides numerous schools of high repute. It possesses in Forest Park (1,370 acres), Tower Grove Park (276 acres), and the Missouri Botanical Garden (the gift of Henry Shaw)

pleasure grounds both lordly and spacious, and in 1904 was the site of the Louisiana Purchase Exposition, or World's Fair. The Eads steel bridge (constructed 1869-74) is built on three arches, of which that in the centre has a span of 520 feet and each of the others a span of 504 feet, and three miles farther up the river is the Merchants' Bridge, completed in 1890 and utilised exclusively by railways. The history of the city dates back to 1764, when the French Louisiana Fur Company established a station here; but it had made little progress in 1803, when Louisiana was purchased from France by President Jefferson. Since 1840 its growth has been rapid, and its trade continues to increase from year to year. It is the centre of an agricultural district from which it receives large supplies of grain; cotton is also imported extensively, and beer, corn, and tobacco rank

tory the river flows. There is a railway to Dakar (18,447), 130 miles to the south-east, where there is excellent harbour accommodation available for steamers, and which is the administrative seat of the Governor-General of French West Africa. Pop. (1901), 24,070.

St. Lucia, one of the British West India Islands, in the Windward group, lying, in 14° N. and 60° W., between Martinique to the north and St. Vincent to the south. It has an area of 233 square miles. The island is of volcanic origin, and the crater of Soufrière still gives off sulphurous gases. The surface is mostly mountainous, rising at two points to a height of 3,000 feet. Dense forests still prevail, and the valleys are well cultivated. Sugar, cacao, rum, logwood, and spices are the principal products. The island is governed by an



ST. MARY'S LOCH.

[Photo: Wilson, Aberdeen.]

among its chief products. The principal manufacture is that of boots and shoes. Pop. (1840), 16,469; (1900), 575,238.

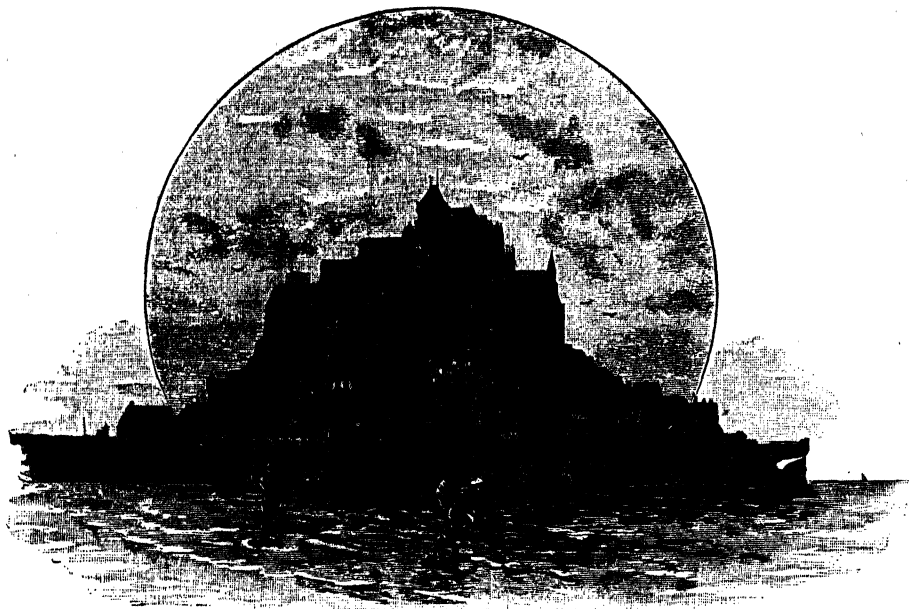
St. Louis, capital of the French colony of Senegal, West Africa, on a sandy island, about 10 miles from the mouth of the Senegal in the Atlantic. Though substantially built, it is unhealthy, lying very little above the level of the river and the marshy lagoons it forms, the exhalations of which are noisome. The principal buildings are Government House, the great mosque, the Roman Catholic cathedral, and the court-house. Owing to the bar at the mouth of the Senegal, ships cannot approach the city without the aid of a pilot, but the export and import trade are nevertheless considerable, especially in textiles, arms, rice, and building materials, with the tribes through whose terri-

administrator, with a nominated executive and legislative council. Discovered by Columbus in 1502, when it was peopled by Caribs, it was settled by the English in 1639. Afterwards it passed alternately into the hands of English and French, being finally ceded to Great Britain in 1803. In 1797-8 Sir John Moore was in command of the island. Castries (7,757), on the north-west coast, is the capital. Pop. (1904), 52,682.

St. Malo, a fortified seaport in Brittany, at the mouth of the Rance, in the department of Ille-et-Vilaine, France, 42 miles N. by W. of Rennes. It is built in the form of an amphitheatre on a rocky island connected by a causeway (the Sillon) with the mainland. The ancient walls and narrow, winding streets give the town a picturesque mediæval aspect, almost accentuated

by its smells. Among the principal buildings are the old castle, cathedral, town hall, and museum. The harbour, which is safe but difficult of access, is dry at low water, but at spring tides has a depth of 45 or 50 feet. St. Malo carries on a large trade, mainly with Great Britain, the chief exports being butter, eggs, potatoes, buckwheat, barley, and fruit. The industries include shipbuilding, the fisheries, and the making of ropes and sails. In summer the excellent sea-bathing attracts large numbers of visitors. There is coastal communication between St. Servan and St. Malo by means of the *pont roulant*, or "rolling bridge." The town

at its broadest part, between Coppercleuch and Bowerhope. Of the ancient Kirk of St. Mary nothing remains but the rude churchyard. It was first mentioned about 1275, and bore such various names as the Forest Kirk (where, it has been said, William Wallace was chosen Warden of Scotland), St. Mary's of Farmainishope, St. Mary of the Lowes, and the Kirk of Yarrow. It was destroyed in June, 1557, during a feud between the Scots of Buccleuch and the clan Cranstoun. It was partially restored, but never regained its former consequence, and when a new church was built farther down the valley, St. Mary's ruins were gradually swallowed up



MONT ST. MICHEL.

took its name from Malo (Maclovius or Malovius), a Welsh priest, who sought its shelter in the 6th century. In the 17th and 18th centuries English fleets repeatedly sustained severe checks off the port. Among the goodly number of famous natives were Jacques Cartier, the explorer; René Duguay-Trouin, the admiral; Lamennais, the theologian; Maupertuis, the mathematician; and Chateaubriand, who was buried, by his own desire, on the adjoining granite islet of Grand Bé in 1848. Pop. (1901), 11,486.

St. Mary's Loch, a freshwater lake, Selkirkshire, Scotland, the largest in the south of Scotland, 16 miles W. by S. of Selkirk, 15½ miles N.E. of Moffat. It measures 3 miles in length, 7½ miles in circumference, and 1 mile in breadth

in the ground. It figured in many of the old ballads, such as "The Douglas Tragedy." The lake is situated 729 feet above the sea, and its quiet beauty and deep peace have been sung by Sir Walter Scott, James Hogg, William Wordsworth, and many Border poets. Near the head of the loch stood Tibbie Shiel's famous inn, which, considering its unpretentious character, attracted more celebrated men than any other hostelry of similar size in the world. Among the clients of Tibbie (1782-1878) were "Christopher North," the Ettrick Shepherd, Aytoun, Stoddart (the angler-poet), Alexander Russel, Henry Glassford Bell (sheriff and poet), Sir David Brewster, Principal Shairp, Dr. Chalmers, Dr. Guthrie, Dean Stanley, Professor Caird, Professor Blackie, and a host of other professors from Edinburgh, Glasgow, and St. Andrews;

while the roll of distinguished visitors included the names of Edward Irving, Thomas Carlyle, Eliot Warburton, W. E. Gladstone, Dr. John Brown (author of *Rab and his Friends*), and Robert Louis Stevenson.

St. Michael's Mount, a pyramidal rock of granite in Mount's Bay, Cornwall, 3 miles E. of Penzance. It is connected with Marazion on the mainland by a causeway which is covered by the tide during eight hours out of the twelve. The castle on its summit (195 feet above the sands), which has belonged to the St. Aubyn family since 1660, occupies the site of a Benedictine priory founded by Edward the Confessor. The ancient portion comprises a hall, a refectory, a Perpendicular chapel, and a tower, also Perpendicular, with a stone lantern (commonly called St. Michael's Chair) at the south-west angle. At the base of the Mount, on the Marazion side, are a few houses, a harbour and pier.

St. Michel, MONT, an insulated granite rock of conical form off the department of Manche in Normandy, France, 8 miles W.S.W. of Avranches. Its steep ascent from the surrounding sands to a height of 242 feet, where it terminates in a platform on which there are buildings, gives it a very picturesque appearance. A temple or fortress attributed to Druids existed here at a very early date, and in the 8th century a Benedictine monastery was erected on the spot where St. Michael had appeared in a vision. The castellated buildings of the abbey range in date from the 12th to the 16th century. At the foot of the mount there is a town of about 400 inhabitants. For considerable periods the buildings have been a State prison, and Cardinal Ballue and Armand Barbès were among those confined here. The rock is connected with the mainland by means of a causeway.

St. Nazaire, a seaport of the department of Loire-Inférieure, France, on the northern shore of the estuary of the Loire, 35 miles W. of Nantes. Owing to the difficulties of navigating the river as far as Nantes, St. Nazaire has become the deep-sea port of this town. It contains docks capable of accommodating liners. The industries include shipbuilding, carried on on an extensive scale, and it has large iron-works, flour-mills, and saw-mills. A sanatorium has been established at La Baule, and this place and Saint Marguerite, noted for their invigorating air, are largely resorted to for sea-bathing and purposes of health. Pop. (1901), 35,813.

St. Neots, a town of Huntingdonshire, England, on the right bank of the Ouse, 9 miles S. by W. of Huntingdon. The river is crossed by a stone bridge of three arches, built in 1589, which communicates with Bedfordshire. The Perpendicular church of the Blessed Virgin Mary is an exceptionally fine structure, and other buildings include the corn exchange, the public rooms, Victoria Museum, and the

library and literary institute. The industries comprise paper-mills, breweries, flour-mills, engineering works, and malting-kilns and barm. Pop. (1901), 3,880.

St. Nicolas, a town of East Flanders, Belgium, 20 miles E.N.E. of Ghent. It has a fine town hall, and a spacious market-place, where, in 1497, Philip the Fair vowed to maintain the privileges of the Pays de Waes, an ancient district of which St. Nicolas was the capital. The chief manufactures are textiles and needles. Pop. (1900), 31,083.

St. Omer, a town of the department of Pas-de-Calais, on the Aa, 24 miles S.E. of Calais. It was named after Omer, Bishop of Thérouanne in the 7th century. Owing to its position it was repeatedly harried by French, British, and Flemings, but was assigned to France in 1678. Among the principal buildings are the cathedral of Notre Dame, containing a 12th-century image of the Virgin in wood to which pilgrimages are constantly made, the church of St. Sepulchre with a fine spire and stained-glass windows, the town hall, largely constructed of the materials of the abbey of St. Bertin (of the abbey church only the lofty tower and some arches remain), the military hospital (once the English Jesuit College, founded in 1592, where Daniel O'Connell was educated), the court-house (formerly the episcopal palace), and the library. The manufactures comprise textiles, hosiery, tobacco pipes, sugar, starch, spirits, flour, and paper. Pop. (1901), 20,687.

Saintonge, formerly a province in the west of France, bounded on the N. by Anis and Poitou, on the E. by Angoumois, on the S. by Guienne, and on the W. by Guienne and the Bay of Biscay. Saintes was the capital. The area is now represented by most of the department of Charente-Inférieure and part of that of Charente.

St. Paul, the capital of Minnesota, United States, on the left bank of the Mississippi, a short distance below the point where it is joined by the Minnesota, 10 miles below the falls of St. Anthony. It is thus the head of navigation. The settlement of the city dates from 1838, and it derives its name from the log church which was erected in 1841, and which a Jesuit priest had dedicated to Saint Paul. The site was not an ideal one for a town, the ground rising in terraces (in some places steeply) from the stream and not lending itself readily to the construction of streets. The larger part stands on a plateau 70 feet above the river, in the midst of an amphitheatre of hills. The public buildings include the State Capitol, custom house, city hall, city market, and chamber of commerce. Associated with the city are Macalester College (Presbyterian), Hamline University (Methodist), and St. Thomas's College (Roman Catholic). The manufactures comprise agricultural implements, waggons, carriages, machinery, flour, and boots and shoes, but the town is a distributing rather than an industrial centre. Pop. (1900), 163,065.

St. Paul de Loanda (SÃO PAULO DA ASSUMPÇÃO DE LOANDA), the chief town of Angola, Portuguese West Africa, situated in 9° S. Founded

in 1578, four years after the Portuguese had annexed the country, it was captured in 1641 by the Dutch, who held it for a period during which it became a slave port. When the Portuguese recovered it they still made slave traffic their chief business, and after this trade ceased the town declined. It was laid out on spacious lines, but its grandeur is more apparent than real; the harbour, though the best in the Atlantic tropics south of the Equator, is shoaling up, and the general air of shabby gentility is unmistakable. Gas was introduced in 1893, and a railway has been constructed inland as far as Ambaca, 150 miles to the east. It is almost wholly a distributing centre. Pop. (estimated), 50,000, though some authorities place it at not more than half of this number.

St. Paul's School, LONDON, was founded (1509-12) by John Colet, Dean of St. Paul's Cathedral, for 153 boys without restriction as to class or nationality. It was originally in St. Paul's Churchyard, and was burnt in 1666. Two later schools were built, and in 1884 it was removed, under a scheme of the Charity Commissioners, to King Street, Hammersmith, and has accommodation for 500 boys, with a modern school for 500 boys and a high school for 400 girls. Its governors are appointed partly by the Mercers' Company and partly by the Universities. There are exhibitions to Oxford, Cambridge, and Woolwich. William Lilye was the first high-master, and among noted Paulines were John Milton, Samuel Pepys, the Duke of Marlborough, Judge Jeffreys, and Benjamin Jowett.

St. Peter Port, the chief town of Guernsey, Channel Islands, situated on the east side of the island, 115 miles S.W. of Southampton. Owing to its natural features and the Continental aspect of the houses on the front, it presents a very picturesque appearance from the harbour. The principal buildings are St. Peter's Church (1312), a good example of the Flamboyant style, St. James's Church (1818), the court-house, the markets, the Guille-Allès library and museum (formerly the assembly rooms), Candie House, Fort George, Elizabeth College, founded by Queen Elizabeth in 1563, the hospital (1742), the Victoria Cottage Hospital (1888), Castle Cornet, at one side of the harbour and connected with the mainland by a breakwater, and Hauteville House, the residence of Victor Hugo, still in much the same condition as when he occupied it, and containing, among other things, some beautiful examples of oak carving. The industries are chiefly concerned with the granite quarries and the growth of tomatoes, grapes and other fruits and vegetables for the early markets. The capacious harbour does the whole of the export and import trade of the island. Pop. (1901), 18,264.

St. Petersburg. [PETERSBURG.]

St. Pierre, the largest town though not the capital of the French colony of Martinique, one of the Lesser Antilles Islands, in the West Indies. It was founded in 1665, and was the birthplace of Josephine, Napoleon's first wife. It had many

handsome buildings, but was overwhelmed by an eruption of St. Pelée on May 8th, 1902, when the bulk of the population and 5,000 of the dwellers in the suburbs perished. Yet another fine town has risen from the ashes of the old one. Pop. (1901), 26,011.

St.-Pierre, JACQUES HENRI BERNARDIN DE, romantic writer, was born at Havre, France, on January 19th, 1737, and educated at Caen and Rouen. He was apprenticed to an engineer, after which he served for a time in an engineering corps in the army, and spent a few years in wandering from one European country to another in somewhat aimless fashion. He was despatched to Île de France (Mauritius) on a Government commission in 1768, and passed three years on the island, not without results, as afterwards appeared. His literary tastes, however, led to his formally devoting himself to authorship, and he produced various admirable works, such as *La Chaumière Indienne*, *Études de la Nature* (1784), *Harmonies de la Nature*, and especially the beautiful story of *Paul et Virginie* (1787), which went through fifty editions in a year, and is known and appreciated throughout the civilised world. So touching and graceful an idyll came as an oasis in the materialistic desert of French literature of the period. St.-Pierre was an enthusiastic disciple of Rousseau, and his intense love of nature was largely due to his study of Jean Jacques' writings. Napoleon conferred upon him the Legion of Honour, and he was given a pension of 6,000 francs by Joseph Bonaparte. He died at Éragry, near Pontoise, on January 21st, 1814.

St. Quentin, a town of the department of Aisne, France, on the right bank of the Somme, 23 miles S. of Cambrai. The church is a noble building, ranging in date from the 12th to the 15th century, with a crypt of much greater age. The handsome Gothic town hall was erected in the 15th and 16th centuries. Cotton goods and embroidery, machinery, paper, sugar, soap and beer are manufactured on a large scale. It was named in honour of Cains Quintinus, who was martyred in the 3rd century whilst preaching Christianity. Philip II. of Spain celebrated its capture in 1557 by building the palace of the Escorial, but it was restored to France two years later, and in 1560 formed part of the dowry of Mary Stewart. During the Franco-German war a hostile attack was repulsed on October 8th, 1870, but the Germans retaliated on January 19th, 1871, with a crushing defeat of General Faidherbe and the capture of thousands of prisoners. Pop. (1901), 50,270.

St.-Réal, CÉSAR VISCHARD, ABBÉ DE, historian, was born at Chambéry, Savoy, in 1639, and was educated by the Jesuits at Paris, whither he was sent at the age of sixteen. He gave much attention to historical study, and was made historiographer of Savoy after his return from England, whither he had accompanied St. Evremont and the Duchess of Mazarin. He wrote the memoirs of the last-named, but his principal work is his *Conjuration de Venise* (1674), a masterpiece in its

way, modelled on Sallust. He died at Chambéry in 1892.

St.-Saëns, CHARLES CAMILLE, composer and musician, was born at Paris on October 9th, 1835. He early showed great musical talent and studied the piano under Stamaty, harmony under Maleden, and (at the Conservatoire, which he entered in 1847, and where he won numerous prizes) the organ under Benoist: here, too, he studied under J. F. Halévy. He became organist of the church of St. Méry in 1853, and, five years later, was appointed to the Madeleine. He gained the prize offered in 1867 by the International Exhibition for his cantata *Les Noces de Prométhée*. In 1877 his sacred drama *Samson et Delilah* was produced at Weimar. Among his best-known works should be named, in addition to the two already mentioned, *La Princesse Jaune* (1872), *Le Timbre d'Argent* (1877), *Étienne Marcel* (1879), *Henri VIII.* (1883), *Ascanio* (1890), *Phryne* (1893), *Dejanire* (1898), and *Les Barbares* (1901), besides symphonies in A and C, the "Danse Macabre," and concertos for the piano, violin and violoncello, and several orchestral pieces. He was elected a Member of the Institut in 1881, and is LL.D. of Cambridge University. Though his operas were not successful, his attainments are of the highest, and he ranks as one of the most scholarly musicians his country has ever produced, while as an executant on the piano and organ he has displayed the greatest qualities of a virtuoso.

Saintsbury, GEORGE EDWARD BATEMAN, man of letters, was born at Southampton, England, on October 23rd, 1845, and educated at King's College, London, and Merton College, Oxford. For some years he held appointments as a master at various schools, but from 1876 to 1895 became an influential reviewer and critic on the London daily and weekly press and in the monthly magazines, specialising in English and French literature. In 1895 he was appointed to the Chair of Rhetoric and English Literature in Edinburgh University, and no higher tribute could have been paid to his accomplishments than to be chosen as the successor of David Masson. His works include *Dryden* (1881), *A Short History of French Literature* (1882), *Marlborough* (1885), *Elizabethan Literature* (1887), *Essays in English Literature* (1890; 1895), *Essays on French Novelists* (1891), *The Earl of Derby* (1892), *Nineteenth Century Literature* (1896), *The Flourishing of Romance and the Rise of Allegory* (1897), *Sir Walter Scott* (1897), *A Short History of English Literature* (1898), *Matthew Arnold* (1899), *A History of Criticism* (1900), *The Earlier Renaissance* (1901), *Minor Caroline Poets* (1905), and *A History of English Prose* (1906).

St. Servan, a town in the department of Ille-et-Vilaine, France, on the right shore of the estuary of the Rance, adjoining St. Malo, from which it is separated by a creek one mile wide. The stronghold of Druidism in that part of Gaul, it was converted to Christianity by St. Malo in the 6th century, and at a later date was named after St. Servan, the apostle of the Orkneys. The tower of

Solidor was erected in the 14th century in order to resist the claim of the Bishop of St. Malo to temporal authority over the town. There is a considerable influx of visitors every summer. Pop. (1901), 12,597.

St.-Simon, CLAUDE HENRI, COUNT DE, socialist and humanitarian, was born at Paris on October 17th, 1760, and studied under D'Alembert, afterwards proceeding, in the name of Liberty, to fight for the New England colonies against Great Britain, though taking scarcely any part in his own country's Revolution. His sympathetic nature led to his founding the party or sect called after his name, his desire being to ameliorate the suffering of the masses. In pursuance of this object he spent his fortune, and, disbelieving in hereditary rank, renounced his title. One of his chief propositions was that industry alone was the cause of happiness, and that rank should depend upon the fitness of the individual to live up to the ideal of labour. He made himself a beggar by his scheme, and was at times literally starving, being glad at last to obtain a clerkship at £40 a year. In 1823 he attempted suicide, and died two years afterwards in Paris on May 19th. He had comparatively few disciples, though many of them were, or became, men of high distinction. The sect broke up chiefly through disputes as to the position of women. His system was an essentially religious and despotic type of Socialism. In 1807 he formulated it in the *Introduction to the Scientific Achievements of the 19th Century*, and his later works, such as *L'Industrie, ou Discussions politiques, morales et philosophiques* (1817), *Catéchisme des Industriels* (1823), *Nouveau Christianisme* (1825), are full of his ardent philanthropy. He was the inspirer of Auguste Comte.

St.-Simon, LOUIS DE ROUVEROY, DUC DE, statesman and memoirs-writer, was born at Versailles, France, on January 16th, 1675, and educated privately and at Rochefort. He became a notable diplomatist in the reign of Louis XIV. He had been a soldier, and had fought in Flanders, but diplomacy was a natural outcome of his keen, observant mind. He lived in what has been called the Augustan age of French literature, and his remarkable *Mémoires* are probably the most valuable record of the time in existence. There all his famous contemporaries appear, and many hidden springs of royal action are revealed. Saint-Simon was a courtier, and was entrusted in 1721 with the task, as ambassador to Spain, of arranging a marriage between the Infanta and Louis XV. He was also a member of the council of the Duke of Orleans. He died in Paris on March 2nd, 1755, weighed down by years and debt. The first complete edition of his *Mémoires* appeared in 1830, but there is a later edition in 30 volumes.

St. Stephen's Chapel, WESTMINSTER, was built by King Stephen in immediate contiguity to the Palace. Rebuilt by Edward I., it was burned down in 1298, and rebuilt under Edward II. and Edward III. in the most perfect style of Decorated Gothic. Its walls, painted in exquisite fresco work, were covered with wainscoting when the

chapel was adapted for the use of the House of Commons in Edward VI.'s reign. It was partly demolished in 1800, when the House had to be enlarged to provide room for the Irish members, and was almost completely destroyed by the fire of 1834. Its crypt alone survived, and is now incorporated—a "bedizened coal-hole," in the words of a minister of savage tongue—in Westminster Palace. Its name, however, has survived as a synonym for the Houses of Parliament themselves.

St. Thomas (Portuguese, *São Thomé*), an island in the Gulf of Guinea, West Africa, immediately north of the Equator, 166 miles W. of the Gaboon, the nearest point of the continent. It is 32 miles long, 21 miles from east to west, and covers an area of 360 square miles. The surface is mountainous, reaching a height of 6,000 feet in the peak of St. Thomas. The rich volcanic soil yields cacao, coffee, rubber, and cinchona. St. Thomas, the capital, is situated on the north-east coast. The island was discovered by the Portuguese about 1470. Pop. (1902), 42,103.

St. Thomas, one of the Virgin Isles, West Indies, 36 miles E. of Porto Rico. It is 13 miles long from east to west, 3 miles broad, and covers an area of 33 square miles. Its highest point is 1,586 feet above sea-level. Before the abolition of slavery (1848), sugar-planting flourished, but now vegetables, fruit, guinea grass, and cotton are the only products, and the island is not self-sustaining. The port of Charlotte Amalie, on the south coast, is the chief town. The island was discovered by Columbus in 1493, colonised by the Dutch in 1657, and acquired by Denmark in 1671. The neutrality of Denmark in several wars stood in good stead, as it was the port where prizes were taken for sale and also whence colonial produce could be sent to Europe. In 1764 the Danish king threw the port open to vessels of all nations, and in 1871 removed the headquarters of his West Indian possessions from St. Croix to St. Thomas. Pop. (1901), 11,012.

St. Victor, ADAM OF, a Latin hymnologist of the 12th century, who lived in the Augustinian abbey of St. Victor in Paris, and was a personal friend of Thomas Becket. His complete hymns were published in 1858, and are considered excellent specimens of mediæval Latin poetry. HUGH OF ST. VICTOR, who was born in 1097 and died in 1141, was called the Second Augustine, and was a famous mystic. He taught theology at the abbey of St. Victor, and one of his pupils was RICHARD OF ST. VICTOR, a Scot, who became prior in 1162 and died in 1173, and whose works were collected and published for the first time in 1506. He was more of a mystic even than his master.

St. Vincent, an island of the Windward group of the Lesser Antilles, West Indies, 100 miles W. of Barbados. It measures 18 miles from north to south by 11 miles in breadth, and occupies an area of 132 square miles. The island is volcanic, the highest point, the Soufrière, being in activity in 1812 and 1902. It was also devastated by a hurricane in 1898. Though the yearly rainfall averages 80 inches the climate is not unhealthy, and the

fertile valleys and coastal land produce sugar, cotton, cocoa, spices, arrowroot, and timber, and rum is distilled. Kingston, on the south-western coast, is the capital. St. Vincent was discovered by Columbus in 1498. When Charles I. gave it to the Earl of Carlisle in 1627 it was still inhabited by Caribs. In consequence of hostilities with them, and of the French making common cause with the natives for their own ends, Great Britain took over the island and governed it herself. It is under an administrator and legislative council. Pop. (1901), 47,548.

St. Vincent, CAPE, the south-western extremity of Portugal, situated in the province of Algarve in 37° N. It has been the scene of the following naval battles:—Sir George Rooke defeated the French fleet on June 16th, 1693; Lord Rodney defeated a Spanish force on January 16th, 1780; on February 14th, 1797, Lord St. Vincent defeated the Spanish fleet; and Sir Charles Napier, in the interests of Queen Maria of Portugal, defeated and partially destroyed the fleet of Dom Miguel, the usurper, on July 5th, 1833.

St. Vincent. [JERVIS.]

St. Vitus's Dance. [CHOREA.]

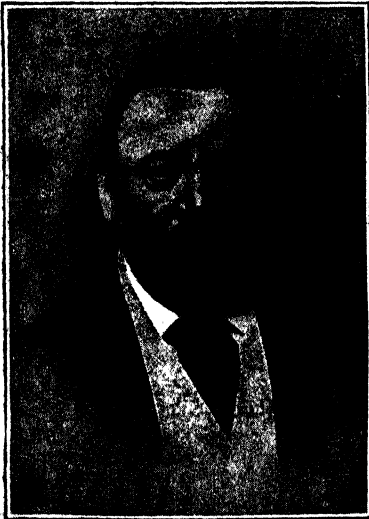
Sakalavas, the aborigines of the west coast of Madagascar. They are a wild people little removed from the savage state, semi-independent of the Central Government, but without national coherence, and divided into a great many tribal groups, of which the most numerous are the Behisotra, Isimahety, Tandrona, and Antankaras. They worship Zanahary, a great spirit dwelling on the mountain-tops, in the forests and rivers. Their type is fundamentally Negro, now doubtless modified by Malay and perhaps by Arab elements. Their speech is Malagasy and differs little from that of the Hovas. Their numbers have been estimated at about 500,000.

Saki (*Pithecia*), a genus of non-prehensile-tailed monkeys of the New World, confined to the swampy forests of the Amazons and tributary and adjoining rivers of tropical South America. The partition between the nostrils is broad; these open sideways and the lower part of the nose is flat. The tail varies in length in different species, so much so indeed that the genus has been divided into the long-tailed section and the short-tailed. The Hand-drinking Monkey (*Pithecia cheiropotes*), of a brownish-red colour, is two feet nine inches long including the tail, and derives its name from its habit, which is doubtless acquired, of lifting the water to its mouth instead of putting down its mouth to drink, in order to avoid wetting its long, thick beard, of which it is inordinately vain. It struck Humboldt and Broderip as being singularly human in its aspect. In the Hairy Saki (*Pithecia hirsuta*), the tail of speckled grey is eighteen inches long (fully longer than the body). This creature, which seldom lives more than a few weeks in captivity, yet displays more attachment to man than any other monkey of the continent. There is a rare Saki (*Pithecia* or *Brachyurus calvus*) whose appearance is extremely grotesque. This is

variously known as the Scarlet-faced or Bald-headed Saki, or Ukari. It is a little creature with very short tail, has long, shining, whitish hair, a nearly bald head, and its face is of a bright scarlet. Its bizarre look is enhanced by a pair of bushy, sandy whiskers meeting under the chin, and reddish-yellow eyes. In the Black-headed and White-headed Saki (*Pithecia melanocephala* and *leucocephala*) the tail is very bushy, but does not exceed three inches in length.

Sakuntala, a female character of Hindu mythology whose story forms the subject of a drama. Heavenly nymphs used to descend to tempt the sages, and such a one overcame Viswanidra and bore him a daughter, Sakuntala. After a time the mother returned to heaven, and the sage to religion, and the daughter was taken care of by another sage, who dwelt in a forest where reigned the princes of the Lunar line. A prince met her and married her with the sanction of the deities, and her son was founder of the race of Bháratas.

Sala, GEORGE AUGUSTUS, journalist, was born in London on November 24th, 1828, and educated at home and in Paris. His grandfather was Italian,



G. A. SALA.

(Photo: Van der Weyde).

his mother French, and, thanks to the latter, he soon became an expert in her language. His decided gift for drawing induced him for a time to turn to scene-painting and the illustration of books, but Charles Dickens's appreciation of some articles contributed to *Household Words*, and later to *All the Year Round*, finally led him to adopt the literary calling. In 1857 he began his connection with the *Daily Telegraph*, which lasted almost unbroken till 1888. From the proprietors of the paper he received, as he said, "the wages of an ambas-

sador and the treatment of a gentleman." In 1859 he published *Twice Round the Clock, or the Hours of the Day and Night in London*, a collection of social sketches which had a wide and lasting vogue. From 1860 to 1886 he was engaged in supplying the *Illustrated London News* with a column of gossip and anecdote under the title of "Echoes of the Week," and initialised "G. A. S.," which became a feature of the paper. To the first and second volumes of *The Cornhill* (1860) he contributed the series of essays which six years later appeared in volume form as *William Hogarth, Painter, Engraver and Philosopher*. In 1860 he founded *Temple Bar*. Among his novels, which never acquired any real hold on popular favour, were *The Seven Sons of Mammon* (1862), *Quito Alone* (1863), and *The Strange Adventures of Captain Dangerous* (1863). Towards the latter end of his career he undertook many journalistic travels to various countries of Europe and the United States, culminating in a trip round the globe, of which the descriptive accounts were published in the *Daily Telegraph*, his experiences being retold in *Things I have Seen and People I have Known* (1894). His failing health was aggravated by pecuniary losses in connection with a weekly periodical, *Sala's Journal* (1892), which collapsed in two years. In 1895 he wrote *The Life and Letters of George Augustus Sala*, and in the same year published a comprehensive cookery book, *The Thorough Good Cook*, the subject of *cuisine* having attracted him all his life. He died at Brighton on December 8th, 1895.

Salaam, the form of salutation (strictly, oral) in vogue among certain Oriental peoples. It is their version of the more familiar daily salutations observed among Western nations, and the expression means "Peace!" or "Health be with you!" At times the salutation acquires a much more ceremonious character, in the presence of persons of higher rank than the saluter, when it is gravely performed in dumb show by bowing the head downwards (in extreme cases almost to the ground) and placing the palm of the right hand on the forehead.

Saladin, or SALAH-ED-DEEN, the great Sultan of Egypt and Syria, was born at Telkrit, on the Tigris, in 1137, and when about thirty years old went with his uncle Shirkoh to Egypt to fight the Crusaders. His remarkable courage was soon displayed to advantage, and his uncle was made Grand Vizier, Saladin succeeding him. Gradually increasing his power, he was named sultan on the death of Nouredin in 1173, and soon signalled his prowess by the capture of Damascus, Aleppo, and other cities, entering the Holy Land in 1187, and totally defeating the Christians at Tiberias, under Guy de Lusignan, who was taken prisoner. In October of the same year he captured Jerusalem, and in November laid siege to Tyre without success. When the Third Crusade was started, Saladin had to meet Richard Cœur de Lion, who proved himself a formidable foe; and in 1192 a three years' truce was agreed to, but Saladin died in the following year at Damascus. He was a man of noble

character, moderate and benevolent, discouraging the murders and robberies of his followers, and building throughout Egypt, Syria, and Arabia, mosques, colleges, and hospitals.

Salaman, CHARLES KENSINGTON, the eminent pianist and composer of music, was born in London on March 3rd, 1814. He studied the pianoforte with Beethoven's friend Charles Neate (London) and Henri Herz (Paris), composition with Dr. Crotch, and in 1828 first appeared in public. Performing at Covent Garden Theatre in 1830, in the same year he conducted his Jubilee Ode (choral and orchestral) at the Shakespeare Festival, Stratford-on-Avon, and at the King's Theatre, in the Haymarket, London. In 1833 he began an important series of orchestral concerts, and in 1835 inaugurated Chamber concerts. Elected to the Philharmonic Society and the Royal Society of Musicians in 1837, he made a successful tour in Germany in 1838, and at Vienna played a trio for three pianofortes with Robert Schumann and Mozart's son. Resident in Italy from 1846 to 1848, composing vocal and instrumental music, and conducting concerts, a Beethoven symphony being first heard in Rome under his baton, he was elected honorary member of the Academy of St. Cecilia, Rome, and of the Roman Philharmonic Academy. Returning to England in 1849, Salaman founded the first Amateur Choral Society, and played at the Philharmonic concerts in the following year. In 1855 he began a series of musical lectures, that on the history of the pianoforte and its precursors, illustrated by performances of old music on the old-time instruments (which he delivered in private to Queen Victoria and the Prince Consort), being the basis of all subsequent studies of the subject. In 1858 Salaman was prominent in founding the memorable Musical Society of London, of which he was honorary secretary until 1865. He was also one of the founders of the Musical Association (for the investigation and discussion of subjects connected with the art and science of music) in 1874, acting for some years as honorary secretary and vice-president. Of Salaman's published compositions, ranging from 1828 to 1901, many have taken classic rank—such, for instance, as the anthems, 84th, 29th, 16th, and 6th Psalms; the choral synagogue services in Hebrew; the songs, "I arise from dreams of thee," "Celia," "My Star," "A Hebrew Love Song," "A Leave-taking," "Tamo," "Farewell, if ever fondest prayer," "Sweet, have the roses," "This rose," "I would tell her," "Love's Legacy," "Zahra," "A Love Song," "The Butterfly Song," "Ad Chloen," "Donec Gratus" (duet), and other settings of Horace, Catullus, Anacreon, and the great English and foreign poets; the pianoforte pieces, "Saltarello," "Olelia," "La Notte Serena," "Toccata," "Twilight Thoughts," "La Morenita," "Prelude and Gavotte," "Rondo nel tempo della giga," "Pegasus," "Zephyrus," "Remembrance," "Medora," and the funeral march for orchestra. Charles Salaman's literary works included *Jews as they are* (1882), numerous addresses and articles on musical and Jewish subjects, and *Pianists of the Past*, being personal recollections of all the famous musicians of his time,

from Clementi onwards, published posthumously in *Blackwood's Magazine*. He died in London on June 23rd, 1901. His elder son, MALCOLM CHARLES SALAMAN, the well-known author and critic, was born in London on September 6th, 1855. Drifting from mechanical engineering into journalism, from 1883 to 1894 he was the art and dramatic critic of the *Sunday Times*, and from 1890 to 1899 was on the staff of the *Daily Graphic*. His chief publications are *Ivan's Love-Quest and Other Poems* (1879), *Woman—Through a Man's Eyeglass* (1892) and *The Old Engravers of England* (1906). He is the editor of A. W. Pinero's published plays, while his own acted plays include *Deceivers Ever* (1883-4), *Boycotted* (1884-5), *Dimity's Dilemma* (1887), *Both Sides of the Question* (1891), and *A Modern Eve* (1894).

Salamanca, a city of the province of the same name, Spain, in the old kingdom of Leon, on the right bank of the Tormes, a tributary of the Douro, 110 miles N.W. of Madrid. It is situated on hills rising from an arid plain, and its narrow, winding streets and lofty, splendid structures give it a picturesque and distinguished appearance. The University, one of the most renowned among mediæval places of learning, was founded in 1243, and continued to flourish till the latter part of the 17th century. In the 15th century the 25 colleges of which it then consisted contained some 10,000 students. The buildings are, for the most part, in a late style of Gothic architecture. There are two cathedrals, the more ancient of which is a Romanesque structure of the 12th century. The Duke of Alba was buried in the church of San Esteban. The Jesuit College was erected in 1614. Salamanca has a library containing upwards of 70,000 volumes, besides MSS. The great square, or Plaza Mayor, which is surrounded by colonnades, and was used as a bull-ring, is said to be the largest in Spain. Some of the private mansions, such as the famous Casa de las Conchas (or "House of the Shells," so named from the shells with which the front is decorated), are still perfect examples of the domestic architecture of the city's prosperous era. The leather industry has declined, and the linen, cloth, and earthenware manufactures are not very extensive. Near here Wellington defeated Marmont on July 22nd, 1812. Pop. (1900), 25,000.

Salamander, an animal belonging to the two species of the genus *Salamandra*, type of a family



SPOTTED SALAMANDER.

(*Salamandridæ*) of tailed Amphibians. They are small, newt-like animals, from six to eight inches long, living on land when adult, and feeding on

worms, molluscs, and insects. The Spotted Salamander (*S. maculosa*), from Europe and North Africa, is marked with large yellow patches on a black ground. It has a thick, large head and clumsy body and a tail that is cylindrical at its outer end. Its eyes and tongue are large, and the mouth-gape is wide. It haunts cool, damp places, like old walls and fallen timber, hibernates during winter coiled up in a tree, or wall, or the earth, and in spring and summer sheds its coat piecemeal. Its young are born in the water and have gills. The Black Salamander (*S. atra*), found in the Alps, brings forth its young alive and breathing by lungs. Salamanders are falsely reputed venomous, and were fabled to be able to live in fire, and to extinguish it. Francis I. adopted as his badge a lizard (but the salamander is an amphibian) in the midst of flames with the motto, *Nutrisco et extinguo*, "I nourish and extinguish."

Salamis, the ancient name of Koluri, a mountainous island of Greece, in the Saronic Gulf, off the north-western coast of Attica, 10 miles W. of Athens. It covers an area of 36 square miles, and the nearest point of the mainland is only about a mile distant. A war for its possession between Athens and Megara terminated in favour of the former towards the close of the 7th century B.C. The narrow strait between its eastern shore and the mainland was the scene of the great naval battle of the Persian War, in which the armament of Xerxes, containing 1,200 triremes and 3,000 smaller vessels, was completely vanquished by the combined fleets of the Athenians, Spartans, and Corinthians, numbering in all 366 triremes (480 B.C.). Solon, the great law-giver, and Euripides, the famous dramatist, were natives of the island. Pop., about 7,000.

Sal Ammoniac consists of chloride of ammonium, NH_4Cl , a white solid which may be artificially prepared by the direct union of hydrochloric acid and ammonia, dense white fumes resulting from the combination of the two colourless gases. It has been known from early times. It was imported first from Asia, afterwards from Egypt, where it was prepared from camel's dung, and later it was manufactured by the distillation of horns, hoofs, etc. At the present time it is almost entirely obtained as a bye-product in the manufacture of coal-gas. The gas liquor, as it is called, contains large quantities of ammoniacal salts; it is heated with lime and the ammonia expelled and received in dilute hydrochloric acid. From the solution so formed the sal ammoniac is obtained pure by recrystallisation and sublimation. It forms colourless crystals of the regular system, frequently forming arborescent aggregations. As obtained by sublimation it is usually a tough fibrous mass. It is easily soluble in water, the solution possessing a sharp taste. It is used to a slight extent in medicine, and very largely in the dyeing industry, besides which it finds frequent application in the chemical laboratory.

Saldanha, Oliveira e Daun, João Carlos, DUKE OF, soldier and statesman, was born at Azeiteira,

Portugal, on November 17th, 1791, and served under Marshal Beresford in the Peninsula, distinguishing himself greatly during his military career. About 1817 he went to South America, where he fought both in Monte Video and Brazil, returning to Europe soon after the latter country declared her independence of Portugal. He became, in 1825, minister of foreign affairs and governor of Oporto, and fought bravely on the side of Isabella in the struggle between her partisans and those of Dom Miguel. He was not so successful as a statesman, and made many blunders. He led the reactionary party, and between 1836 and 1846 was in exile. He was appointed later to the embassy at Rome, and in 1870 was Prime Minister of Portugal for a few months. He died in London on November 21st, 1876, whilst acting as ambassador of his Portuguese majesty.

Sale, a town of Cheshire, England, on the left bank of the Mersey, $5\frac{1}{2}$ miles S. by W. of Manchester, of which it is virtually a suburb. Many of the merchants of "Cottonopolis" occupy handsome villas in this quarter. The Bridgewater Canal (now the property of the Manchester Ship Canal Company) passes through the town. The rich soil is extremely productive, and market-gardening therefore flourishes. There is also a botanical garden, laid out in hothouses, flower-beds, ferneries and a lake. Pop. (1901), 12,008.

Sale, the transfer of property from one person to another in consideration of a price or recompense in value—in other words, for a valuable consideration. The contract for sale in English law is a real contract, or in the nature of such, some tender or transfer being required to make the sale complete. There is this striking difference between the English and Roman law in the contract for sale, namely, that in the English law the property in a specific article (or in a non-specific article or unascertained bulk so soon as the same becomes specific or ascertained) passes to and rests in the purchaser even before delivery, the vendor retaining only a lien on it while in his possession for the price; whereas in Roman law such property does not pass to the purchaser until after payment of the price and also delivery of the article (*Benjamin on Sales*).

Sale, **BILL OF**, a deed or writing under seal designed to furnish evidence of the sale of personal property. It is necessary to have a bill of sale when the property sold is not immediately transferred to the purchaser. As a safeguard against fraud English law requires a bill of sale to be registered within seven days of its execution, and it must also contain a schedule giving an inventory of the personal chattels assigned.

Sale, **GEORGE**, Orientalist, was born in or about 1697 in the county of Kent, though his father was a merchant in London. In 1720 he was admitted at the Inner Temple. He was, however, never called, but practised as a solicitor. At an early period he devoted himself to the study of Arabic, in which he became an accomplished scholar, though Voltaire's statements that he lived among

the Arabs are hopelessly in error, since he never left England. In 1726 he acted as corrector of the Arabic New Testament printed by the Society for the Promotion of Christian Knowledge, and officiated for the society in various capacities until 1734. In this year he published his translation of the Koran, which yet remains the best version in any language. To Bayle's *General Dictionary* he contributed all the Oriental biographies up to the time of his death, and contributed the history of the world from the Creation to the Flood to the *Universal History*. He died in London on November 13th, 1736, and was buried in St. Clement Danes, Strand.

Sale, SIR ROBERT HENRY, general, was born on September 19th, 1782, entered the army in 1795, and, after going to India, where he was present at the storming of Seringapatam in 1799, served throughout the first Burmese War, rising rapidly in rank. From 1838 onwards he commanded the well-known 1st Bengal Brigade, and fought strenuously to extend the British power in India. In Afghanistan, and after the revolt of 1841 against the British in Kabul, he won many victories with his small body of men. As his *sobriquet* of "Fighting Bob" proves, he was fond of the fray and was repeatedly wounded. At Ghazni (1839) he killed his man in hand-to-hand combat, just as in Burma (1824) he had a personal encounter with the Commander-in-chief, whom he slew. On July 23rd, 1839, he was given the local rank of major-general, and for his services with the Army of the Indus was also created K.C.B. From November 12th, 1841, to April 7th, 1842, he was besieged at Jelalabad, and heroically defended the garrison, finally issuing forth and completely routing Akbar Khan. It is known now that Major George Broadfoot (1807-45), garrison engineer, rendered Sale yeoman service, as the life and soul of the defence and as being instrumental in preventing the capitulation at one time contemplated by Sale and a majority of the officers. For his defence of Jelalabad Sale received the Grand Cross of the Bath (1842), and for the intrepidity and skill he had shown in military operations in Afghanistan, the thanks of both Houses of Parliament (1843). He died on December 21st, 1845, from wounds received three days before in the battle of Moodkee.

Salem (properly, *Shelam*), a district of Madras Presidency, India, bounded on the N. by Mysore and North Arcot, on the E. by Trichinopoly, South and North Arcot, on the S. by Coimbatore and Trichinopoly, and on the W. by Coimbatore and Mysore. Its area occupies 7,529 square miles. Excepting in the south, the district is hilly and the Cauvery, Palar and Penner are the chief rivers. The wild animals include the leopard, bear, bison, elephant, wild hog, sambar deer, antelopes and hyenas. The soil is fertile, yielding rice, ragi, millet, pulse, oil-seeds, cotton, sugar, tobacco, coffee, indigo and medicinal plants. The leading industries are weaving and cutlery. The district has been terribly scourged at times by famine. Salem (70,627), the chief town, is situated 175 miles S.W. of Madras. Pop. (1901), 2,205,898.

Salem, a seaport of Massachusetts, United States, 15 miles N.E. of Boston. Founded in 1628 by John Endicott, Salem soon became noted for its persecution of witches, many of those poor wretches perishing on Gallows Hill. The house in which Roger Williams resided in 1635-6 is still extant, and First Church is the oldest Protestant place of worship in America. Nathaniel Hawthorne and W. H. Prescott were natives of the town. The principal public buildings are St. Peter's Episcopal Church, Plummer Hall (containing the Salem Athenæum), Essex Institute, East India Marine Museum, Peabody Academy of Science, and several philanthropic and educational institutions. The town's commercial traffic has largely declined, but the manufactures are important and include cottons, leather, boots and shoes, machinery and lumber products. Pop. (1900), 35,966.

Salerno, a seaport and capital of the province of Salerno, Italy, finely situated at the head of the Gulf of Salerno, 30 miles S.E. of Naples. In the latter part of the 11th century it fell into the hands of the Normans under Robert Guiscard, who fixed his court here and built the stately cathedral. This edifice, which has a façade of granite Corinthian pillars, is dedicated to St. Matthew, whose bones are said to have been brought hither in 954. In mediæval times the university was celebrated for its medical school. The manufactures include silks, cottons and linens, pottery, leather, wine, and macaroni, besides printing and iron-founding. Pop. (1901), 42,700.

Salford, a town of Lancashire, England, situated immediately to the west of Manchester, from which it is separated by the Irwell. The Corporation has displayed a very progressive spirit, and owns the tramways, gas and electric light and power, markets (including cattle), and slaughter-houses, baths, library, and cemetery. The municipal charter dates from 1844. The town was represented by one member of Parliament from 1832 to 1868, and by two from this date to 1885, in which year a third was added under the Redistribution Act. It is a Roman Catholic diocese, and the cathedral of St. John is in the Decorated style. The public buildings include the town hall, the free library and museum, and the Royal Hospital and Dispensary, and other philanthropic institutions. The beautifully laid-out Peel Park, named after the great statesman, containing statues of Queen Victoria and Sir Robert Peel, is the most generally known of the public spaces. Salford combines with Manchester in many common interests and manufactures. Pop. (1901), 220,957.

Salicin, a substance belonging to the group of compounds known as glucosides, which is found chiefly in the bark of various species of willow and poplar. It may be extracted from this source by means of water, and by crystallisation is obtained as bright colourless prisms which melt at 198°. It possesses a very bitter taste, and by the action of acids or certain natural ferments—*e.g.*, emulsin—it splits up into glucose and salicylic alcohol.

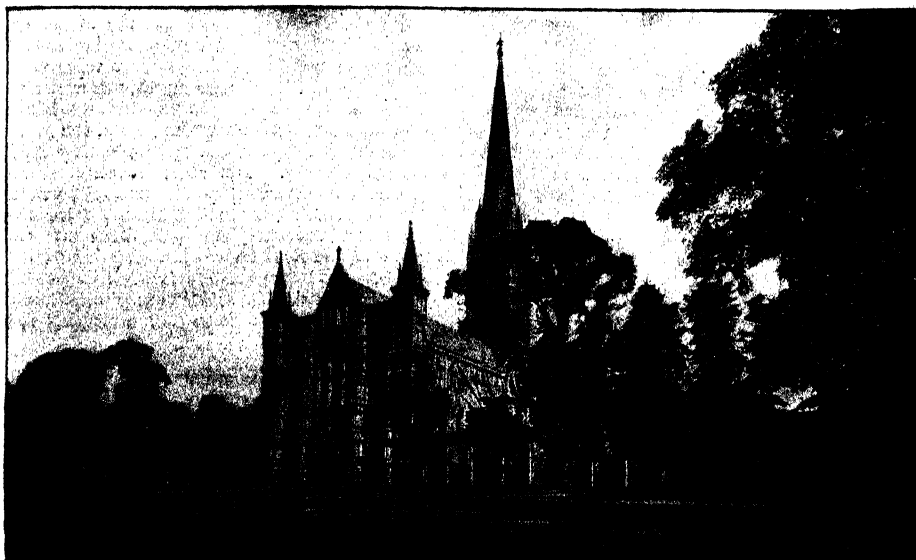


Salicin, SALICYLIC ACID, SALICYLATE OF SODIUM. These drugs are largely employed in the treatment of joint affections, the salicylate of sodium being especially used in acute rheumatism (in doses of 10 or 20 grains). When the drug is administered in large doses, it produces buzzing in the ears, deafness, perspiration, impairment of vision, and it may be even delirium.

Salic Law was the code which governed the Salian Franks, who founded the Frankish kingdom. In a stricter sense it is applied to the custom which makes a female ineligible to reign or hand on a right to the crown. This law obtained in France from the time of the Frankish Clovis to the end of the monarchy, and was used to bar the claim of

decomposes. It is readily recognised by the production of a deep violet colour when ferric chloride is added to its aqueous solution. It is a good antiseptic, and is used as such in surgery, while it also finds other medicinal applications.

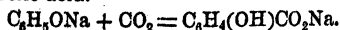
Salisbury, or NEW SARUM, the county town of Wiltshire, England, a cathedral city situated in a valley at the confluence of the Avon, Wiley, Bourne, and Nadder, 80 miles W.S.W. of London. The city is built on a regular plan, consisting of streets which cross at right angles, thus forming squares, called "The Chequers," with houses facing the thoroughfare and opening at the back into a court or garden. The glory of Salisbury is its cathedral (1220-58), which is a perfect specimen of Early



SALISBURY CATHEDRAL.

Edward III. to the French Crown. A similar law is in force in most German states, and therefore Queen Victoria did not succeed to Hanover.

Salicylic Acid, or ORTHO-OXYBENZOIC ACID, is represented by the chemical formula $C_6H_4(OH)CO_2H$, and consists of benzoic acid in which one of the hydrogen atoms has been replaced by the group OH (hydroxyl). It occurs naturally in the buds of some species of spiræa, and also combined with methyl alcohol in oil of wintergreen. It may be also prepared artificially by many chemical reactions, as by the action of carbonic acid and sodium on carbolic acid.



It forms four-sided prisms which melt at 156° . It is only slightly soluble in cold water, but readily in hot, so that it can be easily crystallised. If heated slowly it sublimes, but if heated rapidly

English architecture, the tower and spire alone being additions of the Decorated Period (1330-75). The building comprises a nave of ten bays with aisles, a choir of six bays with aisles, two transepts, one with four, the other with three bays in each wing, a Lady Chapel at the east end, and a central tower with a spire of 400 feet. The external length of the cathedral is 473 feet, and its breadth 111 feet; its height, measured from the inside, is 81 feet. This harmonious structure is unique in that the exterior can be readily and admirably viewed from every side, while the interior is extremely well lighted. There is some remarkably fine stained glass by William Morris from designs by Sir Edward Burne-Jones. Irreparable injury was done to the building by the "restorer" James Wyatt in 1782-91. The beautiful cloisters date from the latter part of the 13th century. Within the Close, which has an area of about half a

square mile, stands the episcopal palace, a long, irregular, picturesque building with gardens opening into the cloisters, and round it are grouped several other interesting old houses. The Market Place, which occupies a central position, covers 2½ acres, and has a handsome council-house (1795) at its south-eastern angle, in front of which are statues of Lord Herbert of Lea (Sidney Herbert), who died at Wilton House in 1861, and Professor Fawcett, who was born in the city in 1833. The Blackmore Museum contains an unsurpassed collection of prehistoric remains. The Halle of John Halle, a banquetting-room built in the latter part of the 15th century, is a very interesting example of the domestic architecture of the period. Other buildings include the Theological College, Diocesan Training School for Elementary Teachers, School of Science and Art, Bishop Wordsworth School for Technical Instruction, Godolphin High School for Girls, County Hall, Free Library, St. Nicholas Hospital, Trinity Hospital, and the Grammar School. A solitary conical mound, a mile north of the city, surrounded by ditches and massive earthen ramparts, is all that now marks the site of OLD SARUM, an important Roman station and the seat of a bishopric from 1075 to 1220, when it was transferred to New Sarum, or Salisbury. Old Sarum was one of the most notorious of the old rotten boroughs, and actually returned two members to Parliament from the reign of Edward I. till 1832, when the scandal was swept away. Pop. (1901), 17,117.

Salisbury, ROBERT ARTHUR TALBOT GASCOYNE-CECIL, 3RD MARQUIS OF, statesman, was



LORD SALISBURY.
(Photo : Russell & Sons.)

born at Hatfield, Hertfordshire, England, on February 3rd, 1830. He was educated at Eton and Christ Church, Oxford, and in 1853 became M.P. for Stamford. He married the daughter of Baron Alderson in 1857, and was long a leading contributor to the *Saturday Review*, and pretty frequently to the *Quarterly Review*. In 1865, on the death of his elder brother, he became Lord Cranborne and heir to the marquise, and in the following year was made Secretary of State for India in Lord Derby's Ministry, retiring in 1867 in consequence of Disraeli's Franchise Bill. Succeeding to the marquise in 1868, he went to the House of Lords, and in 1874 was again Secretary for India, and in 1877 Foreign Secretary. He represented Great Britain at the conference which met in Constantinople in December, 1876, to discuss arrangements

with Turkey whereby the Sultan might allay the discontent of his provinces and the adjoining communities. Turkey proved unamenable to reason, and the conference dissolved, to be followed by war with Russia. At the Berlin Conference of 1878, summoned to reconstruct the map of Europe, Lord Salisbury was the colleague of Lord Beaconsfield, who returned with the proud boast that they had brought "peace with honour." On Lord Beaconsfield's death (1881) he became leader of the Conservative party. He attained to the Premiership in 1885, and again after the defeat of the Home Rule Bill in 1892, and once more in 1895, when he was also Foreign Secretary. In 1900 he was for the fourth time Premier, but relinquished the Foreign Secretaryship. In 1902 he retired from political life, and was succeeded in the Premiership by Mr. Balfour. He died at Hatfield on August 22nd, 1903. In private life he was of unsullied character and a devoted student of electrical science, a pursuit in which, had he been minded to take it up professionally, he might, it is understood, have confidently aspired to the highest honours. In politics he was an unbending Tory, the greatest statesman of his party during the second half of the 19th century. His cold, haughty, reserved demeanour, however, his caustic pen, and venomous tongue—Disraeli described him as a "master of gibes and flouts and jeers"—ill fitted him to be a leader of men, and he was probably indifferent to the rôle. But he taught the Lords to emasculate Liberal measures, and it may yet appear, therefore, that he was more of a curse than a blessing to his party.

Salisbury Plain, an undulating tract, Wiltshire, England, consisting of chalk downs, intersected by fertile, well-wooded valleys. It extends westwards from the eastern border of the county to Westbury and Warminster, a distance of about 22 miles, and from Rushall in the north to the vicinity of Salisbury about 15 miles. It has an average height of 400 feet, the highest point (775 feet) being reached on Westbury Down. The famous Druidical remains at Stonehenge, some six miles north of Salisbury, are the centre of interest. The plain is now utilised for military operations and encampments, for which purposes it is administered from Aldershot.

Saliva, a digestive juice secreted by the channels leading from the three pairs of salivary glands—the parotid (near the ear), the submaxillary (below the jawbone), and the sublingual (beneath the tongue and between it and the lower gums)—mixed with secretion from the mucous membrane of the mouth. It is in order that the viscid saliva—which consists of salts, mucin, and an exceedingly minute quantity of ptyalin (a ferment that turns starch into grape-sugar)—may thoroughly interpenetrate each mouthful of food before it is swallowed that perfect mastication is so constantly insisted on by the doctor. The flow of saliva through the various ducts is stimulated by the presence of food, and should the article of diet be of the nature of a *bonne bouche* or excessively appetising, the secretion will be so great that, in

popular parlance, "the mouth will water." The saliva is alkaline and, when the food in the stomach has been mixed with the acid gastric juice, is neutralised and ceases to act. However, by then it has done its work. In certain feverish states the secretion of saliva is very deficient and the mouth and throat become parched. On the other hand, the flow may be abnormal, as in the administration of mercury or iodide of potassium, the condition being known as salivation or ptyalism. Alteration of the saliva is characteristic of some diseases. If it become acid, as in acute rheumatism, this may be qualified by the use of bicarbonate of soda; if it be foul and evil-smelling, as in dyspepsia and ptyalism, this may be checked by care in diet and the employment of antiseptic mouth-washes, chlorate of potash, or some preparation of charcoal.

Saltee. [RABAT.]

Sallust (CAIUS SALLUSTIUS CRISPUS), Roman historian, was born at Amiternum, at the foot of the Apennines, Italy, in 86 B.C. He entered on public life at an early age, and in the year 52 became a member of the Senate, but two years later, owing to his immoralities, was expelled. He was a warm adherent of Cæsar, who restored him to his position. He became prætor-elect in 47, and accompanied Cæsar on his African expedition, being appointed governor of Numidia afterwards. He accumulated enormous wealth there by oppression and extortion, and returned to Rome to enjoy a life of luxury. Here he built himself a lordly mansion in princely grounds on the Quirinal, and here he died, sated with pleasure, in 34 B.C. He wrote a good deal, much of which is now lost, but his histories of the Jugurthine and Catiline Wars have survived and are models of Latin composition. According to Mommsen they are written in Cæsar's interest, the latter to minimise his complicity in Catiline's conspiracy, and the former to glorify his relative Marius. Sallust was the precursor of Livy and Tacitus, and his style is commendably terse and forcible.

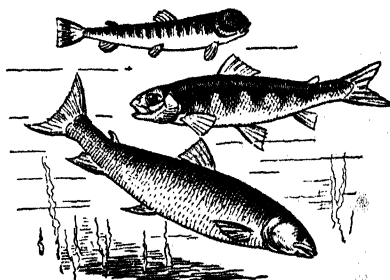
Sally Lunn, a light sweet teacake, rather larger than a muffin, and usually toasted. It is said to have been named after a young woman who hawked this kind of bun in the streets of Bath towards the close of the 18th century.

Salmagundi, an Italian dish consisting of chopped meat, eggs, anchovies, onions, oil, vinegar, pepper and salt. It is in some respects akin to the Spanish olla podrida. There seems no warrant, either in fact or reason, for the suggestion that it was named after a lady-in-waiting of Marie de' Medici, the second wife of Henri IV. It is more probably derived from the Italian *salame*, "salt meat," and *condito*, "seasoned," "pickled," being thus related to a salmi of game.

Salmasius, CLAUDIUS, whose real name was CLAUDE SAUMAISE, scholar, was born at Semur-en-Auxois, in the department of Côte d'Or, France, on April 15th, 1588, and educated at the university of Heidelberg. He wrote Greek and Latin verse at an early age, was devoted to study, and, without a

master, taught himself Arabic, Hebrew, and other languages. He succeeded Scaliger as professor of history at Leyden, and was a friend of Casaubon, Grotius, and others. In 1620 appeared his edition of the *Augustan History* with Casaubon's notes. He embraced Protestantism, the faith of his mother, and in 1623 married Anna Merdier, a Protestant lady of good family. Apparently the union was not happy, for erudite wags of the day likened the pair to Socrates and Xantippe. Six years later he published his *chef d'œuvre*, his commentary on the *Polyhistor* of Solinus. He published in 1649 the work by which he is best remembered, namely, *Defensio regia pro Carolo I.*, which was not written in vain, since it evoked a masterly answer by John Milton, who in his *Defence of the People of England* (1651) entirely demolished the case of Salmasius. The latter replied, but his reply was not published till after his death. In 1650 he went to Sweden at the invitation of Queen Christina, who, however, neglected him after Milton's crushing rejoinder, and he is said to have died of disappointment at Spa in Belgium on September 3rd, 1653. He was greatly admired as a scholar by his contemporaries, and Richelieu desired to keep him in France, that he might write the history of his administration, but he told the cardinal that his pen was not a venal one.

Salmon, a fish belonging to the genus *Salmo*, type of the Physostomous family Salmonide, which also contains the trout, smelt, grayling, vendace, etc. The family has representatives in fresh and salt water, some migrating from one to the other; all food fishes, and most of them highly esteemed. The body is generally covered with scales, the head is naked, and there are no barbules. Behind the dorsal is an adipose fin—a mere fold of skin containing fat; the air-bladder is large and simple,



SALMON.

(Three stages of the development of the salmon.)

and the spawn falls into the abdominal cavity before extrusion. In the type-genus the body is covered with small scales, the mouth-cleft is wide, and there are teeth on the jawbones, palatine bones, vomer and tongue. The anal fin is short. The young bear dark transverse bars, which disappear in the adults. This coloration has been compared to the spots of lion-cubs and some young deer. The geographical range of the genus is limited to

the temperate and arctic zones of the northern hemisphere, their southernmost point in the Old World being the rivers of the Atlas in Morocco and the Hindu Koosh in Central Asia, and in the New World the rivers falling into the head of the Gulf of California.

The Common Salmon (*Salmo salar*) is the largest and most valuable species of the genus, and the most shapely and most beautiful of living fishes. On the upper surface the colour is bluish- or greenish-grey, fading into silvery-white below, and above the lateral line, which is nearly straight, there is a plentiful sprinkling of large black spots. The hinder edge of the gill-cover is rounded. Fish brought to market usually range from 20 lbs. to 40 lbs. in weight. Frank Buckland noted one from the Tay that scaled 73 lbs., and specimens of from 83 lbs. to 93 lbs. are on record. Fish of such a size, however, are very rare, and will grow rarer, owing to the systematic way in which rivers are netted for the market. The adult male is easily distinguished from the female by the protrusion of the lower jaw, and in the breeding season this is developed into a kind of hook, which becomes a formidable weapon in combats with rivals, and with it mortal injuries are sometimes inflicted. During the summer salmon are found along the coasts of the United Kingdom, and in estuaries, entering rivers about the autumn, though the time varies in different rivers, the temperature of the water being probably an important factor in the matter. As a general rule, salmon return to spawn in the rivers in which they were bred. It was formerly thought that salmon were driven from the sea, where their ova will not develop, to the rivers in the fresh water of which they will develop, by the overmastering need for spawning. This is believed now to be only a secondary factor, the migration being primarily due to nutrition—the salmon having, in the sea, stored a certain quantity of food, ceases to feed and returns to the streams. The work of ascending to the upper reaches is often one of great difficulty. The fish move chiefly by night, and are able to pass over a perpendicular obstacle of about six feet in height. To afford them assistance in their journey, fish-ladders are fixed, which serve as landings or resting-places whence fresh leaps can be taken. On arriving at the spawning-ground the female sweeps away the gravel with her tail, and in the trench so formed deposits her ova, the male keeping guard the while. When she has finished her task he swims over the place shedding the milt which fertilises them. As soon as this is done a few sweeps of her tail cover the ova with gravel, and the spawning, which generally occupies about ten days, is completed, and the spent fish are ready to return to the sea. A period of from 90 to 120 days is required to hatch the eggs, but this term varies according to the temperature of the water, and is consequently longer in the Scottish than in the English salmon streams. The eggs, too, have many enemies, and but a very small proportion of the fry that come out ever reaches the sea. When born the young fish still bear the umbilical vesicle attached, and it is not absorbed for some weeks. The form of the

fry is probably as well known as that of the full-grown fish, for the former are well-known microscopic "objects," readily obtainable from any dealer in such wares, and they will live and thrive in an aquarium where there is plenty of vegetation and an abundance of "water-fleas." Few descend to the sea in the first year. It was formerly thought that the migration was always delayed till the second year; but there is evidence that in fish artificially bred the migration of at least a part of them takes place earlier. On the return to fresh water the fish are generally sexually mature, and on their subsequent descent to the sea they assume the character of adults. In its different stages of growth the salmon has a variety of names. According to Dr. Day, "the fish in its full-grown condition is known as the *salmon*; one on its second return from the sea is often termed a *gerling* in the Severn, or a *botcher* on its first return, when under five pounds' weight, although the more general designation is *grilse*; when under two pounds' weight it is usually termed *salmon peel* by fishmongers. From one to two years before it has gone to the sea it is known as a *parr*, *pink*, *smolt*, *smelt*, *salmon-fry*, *sprag*, or *salmon-spring* (Northumberland), *samlit*, *brandling*, *fingerling*, *black-fin*, *blue-fin*, *shed*, *skegger*, *graveling*, *hepper*, *laspring*, *gravel laspring*, *sherling*, or *sparring* in Wales. In Northumberland a milter or spawning male is known as a *summercock* or *gib-fish*, and a salmon as a *simen*. In the Severn a salmon which has remained in fresh water during the summer without going to the sea is a *laurel*. After spawning this fish is a *kelt* or *slat*, but a male is generally termed a *kipper* and a female a *shedder* or *baggit*."

The Pacific Salmon belong to the closely-allied genus *Onchorhynchus*, differing only from the type-genus in the increased number of rays in the anal fin. There are five species, from the rivers of the North Pacific, of which the most important are the Quinnot or King Salmon (*O. quinnot*) and the Blue-back Salmon (*O. nerka*). The annual take of the former, which may reach a weight of 100 lbs., in the Columbia river averages 30,000,000 lbs., of which a large proportion is canned for European markets. The weight of the Blue-back ranges from 4 lbs. to 8 lbs. The flesh of salmon is of a pinkish-orange colour, probably due to the crustaceans which form their principal food.

Salmon-Trout, SEA-TROUT (*Salmo trutta*), a valuable British food-fish, ranging from the south of England to Orkney and Shetland, and found in Wales and Ireland, where it is known as the White Trout. It is closely allied to, but smaller than, the salmon, which it resembles in habit. The body is thicker than that of a salmon of the same length, and the hinder margin of the gill-cover is not so rounded. On their first return from the sea they present a silvery appearance, whence fish at this stage were sometimes made a distinct species (*S. albus*).

Salonica, or SALONIKI, a city and port of a province of Macedonia, Turkey in Europe, at the head of the Gulf of Salonica, an arm of the Aegean Sea, bounding the peninsula of Chalkis on the west.

The original name, Therma (from the hot springs in the vicinity), was changed to Thessalonica by Cassander (315 B.C.), the founder of its importance and commercial prosperity, which was increased by the great Roman road from Dyrrachium (Durazzo) to Byzantium, the Via Egnatia, passing through it. The city is finely situated on the western slope of a hill in a fertile region, but nearly everything that links it with the remote past has perished. The arch of Constantine still stands, though in a dilapidated condition, at the east end of the Via Egnatia, but that at the west end was taken down in 1867 for building materials. Three of the principal mosques—those of St. Sophia, St. George and St. Demetrius—were originally Christian churches. A great import and export trade is carried on at the harbour, and the manufactures include flour, cotton, bricks and tiles, cutlery, beer, soap, leather, agricultural implements, ironware and spirits. Cicero dwelt here for seven months during his exile, and St. Paul's visit was the occasion of a tumult. The apostle addressed two Epistles to the church which he had set up here. The Saracens sacked the city in 904, and sold the inhabitants into captivity. Their barbarities were improved upon in 1185 by the Sicilian Normans. For the barren honour of King of Salonica a succession of claimants kept the city in constant unrest throughout the 13th and part of the 14th century. The Turks, under Sultan Amurath, captured the city on May Day, 1430, when they signalled their success by hacking to pieces the body of the patron saint Demetrius. In 1876 a fanatical Turkish mob massacred the French and German consuls, an outrage that at one time threatened serious reprisals. Pop. (estimated), 100,000.

Salop. [SHROPSHIRE.]

Salpa, one of the best-known genera of the Ascidians belonging to the order Thaliacea. It includes some free-swimming forms of interest, as they exhibit the phenomena of alternation of generations. There is an asexual generation or nurse consisting of a long stolon, upon which buds are developed; these are ultimately set free in a chain and developed into sexual forms; the chain is then broken up into single Salps.

Salsette, an island of Bombay Presidency, India. It lies immediately to the north of Bombay Island, with which it communicates by a causeway, bridge and otherwise. It is 16 miles long and has an area of 240 square miles. The highest point, Thana peak, is 1,530 feet above the sea, and wells yield a water supply. Rice is the principal crop, but the cocoa and palmyra palms flourish. By Buddhists the island is deemed holy, since it contained a tooth of Buddha. The possession of this relic occasioned in the devotees a zeal for excavating caves in the rock, and these, with their colossal statues of Buddha, are now among the sights of the island. The caves at Keneri near Thana are particularly noteworthy. The island was seized by the Portuguese in the 16th century, and properly, along with Bombay, should have formed part of the dowry of Catharine of Braganza (1662) when she married Charles II. The Portuguese dis-

puted the terms of the contract, and did not cede the island for more than a hundred years. The Maharrattas tore it from their feeble grasp in 1739, but they, in turn, were compelled to give it to the British in 1774. Pop. (estimated), 120,000.

Salsify, or **SALSAFY** (*Tragopogon porrifolius*), or (from the taste) **OYSTER-PLANT**, a biennial vegetable, apparently native to Southern Europe, which was more cultivated formerly than now. It has long, narrow, tapering leaves; hollow peduncles thickened near the apex; and an involucre of eight bracts, longer than the purple or rose-coloured ligulate florets. The whole plant is glabrous. The fusiform tap-root has much milky latex and resembles the parsnip in flavour. This wholesome esculent belongs to the sub-order Ligulifloræ of the Compositæ.

Salt, the general name for sodium chloride (NaCl). It occurs either as bay salt from the artificial or recent evaporation of sea-water, or as rock-salt, in beds resulting from such natural evaporation in past geological times. In sea-water it varies in proportion from under 3 per cent. in polar seas to over 3·5 per cent. at the equator. This sea-salt is still the chief source of the salt of commerce in many dry countries such as France, Spain, Portugal, and Austria. Being generally impure, it is known in France as *sel gris* ("grey salt"). In its gradual concentration the sea-water deposits many of the double potassium and magnesium sulphates and chlorides which occur associated with rock-salt in the mines at Stassfurt in Saxony. Rock-salt occurs in beds of almost every geological formation, from the Salina group of the Silurian in Canada, the Permian of Middlesbrough, Yorkshire, and the Hala (Salt) range in Sindh, and the Trias of Cheshire and Salzburg, to the Cretaceous of Wieliczka, in Galicia, and even more modern deposits. It is often associated with bitumen, and almost invariably with gypsum, and much salt is pumped to the surface as brine. This has led to extensive subsidences in Cheshire, Worcestershire and elsewhere, and the formation of lakes or "meres." The salt occurs pure white, ochreous, blue, violet, green, or other colours, and crystallised in cubes or in hollow cubes of remarkable construction. It is 2 in the scale of hardness. Great Britain exports a large quantity annually, mostly from Liverpool, India and the United States being the principal consumers. As mineral or supplementary salt is not requisite to a dietary of milk and raw or roast meat, but is so to cereal or vegetable food, many primitive nomadic peoples have done without it, whilst its use has come in with agriculture. Salt thus also became, and remains, an important article of commerce, many old trade routes being created by this traffic, such as that between Syria and the Persian Gulf by way of Palmyra, a place celebrated for its salt. Cakes of salt have been used as money in Abyssinia, in Tibet, and elsewhere, and Government monopolies or heavy taxes on the trade have been very general. Its use as a preservative is universal. Its value to health has invested it with a quasi-sacred character, so that Homer calls it "divine," and among many

nations; ancient and modern, it is a sign of hospitality and of the bond of honour thereby created. Among the Arabs this feeling operated so powerfully that if a host found that he had unwittingly permitted an enemy to eat of his salt, he would let him go forth unmolested. The position of the guests at table was formerly partly settled with reference to the salt, those seated above it being the select, those beneath it being of lower order or dependents. Salt plays a part in superstition—to spill it being supposed to be unlucky. This is, of course, a tribute to its exceptional virtues.

Salt, HENRY, traveller and collector, was born at Lichfield, Staffordshire, England, on June 14th, 1780, and educated at Lichfield Grammar School and Market Bosworth. He was taught drawing by Glover, of Lichfield, and, in London, by Joseph Farington, R.A., and John Hoppner, R.A. Having accompanied Lord Valentia on his Eastern tour, in 1809 he was sent to Abyssinia by the British Government with presents for the king, who received him with marked favour, and published (1814) *A Voyage to Abyssinia*, which was very successful. Appointed British consul-general in Egypt in 1815, he made three collections of the antiquities. He disposed of the first to the British Museum (1823) for £2,000; the French Government gave him £10,000 for the second; and the third, sold by auction after his death, fetched £7,168. Among his examples were the colossal bust of *Rameses II.* (British Museum), which he employed Giovanni Baptista Belzoni to remove from Thebes, and the alabaster sarcophagus which Belzoni found in the sepulchre of Seti I., and which he sold for £2,000 to Sir John Soane, who placed it in his museum, of which it is now a leading feature. Salt died at Dessuk, near Alexandria, on October 29th or 30th, 1827.

Salt, SIR TITUS, philanthropist and manufacturer, was born at Morley, in the West Riding of Yorkshire, on September 20th, 1803, and was educated at Wakefield. Apprenticed to the wool trade at Wakefield and Bradford, he joined his father's business of wool-stapler in 1824. He showed unwonted aptitude for the utilising of unlikely materials, his first great success following from his handling of a rough Russian wool which other manufacturers could not or would not tackle. Salt subdued it, not by attempting to adapt it to existing machinery but by having machinery specially built for it. In 1836, accordingly, he was already running four mills in Bradford. Similarly, alpaca, the hair of the Peruvian llama, hitherto unmanageable, yielded to Salt's treatment, and he introduced the new fabric called alpaca. He had been elected mayor of Bradford in 1848, and was actually contemplating retiring from business, when he decided to found a manufacturing town particularly adapted to his trade. The result of this new departure was the town of Saltaire, the main mill in which was set going in September, 1853. In 1856 he was chosen president of the Chamber of Commerce in Bradford and, three years later, was elected M.P. for the city. But politics had no charm for him, and he retired from the

representation in 1861. He was created a baronet in 1869, and died on December 29th, 1876.

Salta, a province in the north-west of the Argentine Republic, South America, bounded on the N. by Jujuy and Bolivia, on the E. by Formosa and Chaco, on the S. by Santiago del Estero, Tucuman and Catamarca, and on the W. by Chile. It has an area of 62,184 square miles. The Andean portion of the province is mountainous, but in the east the surface is more level. There is considerable mineral wealth, but the chief industry is agriculture. Pop. (1904), estimated, 136,059. The capital, Salta, 150 miles N. by W. of Tucuman, is a bishopric, and has a national college and custom-house, besides several churches. Pop. (estimated), 18,000.

Saltaire, a town of Yorkshire, England, on the Aire, $3\frac{1}{2}$ miles N.W. of Bradford. It owes its existence to the enterprise of Sir Titus Salt, who had it built in 1853 for the enlargement of his business. The works are estimated to occupy an area of nearly six acres. The town was constructed with every regard for the health of the operatives, who form the bulk of the inhabitants. Besides the mills and accompanying buildings, the other structures include an institute, unusually well equipped, a technical school and the Salt high schools for girls and boys. Sir Titus Salt also presented a park of 14 acres, partly laid out as a recreation ground and partly as a pleasure garden. Pop., 5,000.

Saltash, a town of Cornwall, England, on the right bank of the Tamar, which separates it from Devon, 5 miles N.W. of Plymouth. Its whole environment is extremely attractive, but the feature of the place is the Royal Albert Bridge, which carries the Great Western Railway across the river into Cornwall. The bridge was constructed in 1857-9 from the designs of Isambard Kingdom Brunel. Besides the approaches on either side, there are two spans, each 455 feet long. The central pier rests on bedrock and rises to a height of 240 feet from the foundation. The span is of oval tubing, the ends being connected by chains forming a parabolic curve, from which the permanent way is suspended at a height of 100 feet above high water. The structure is strengthened by struts and diagonal braces. Prince Albert, after whom it was named, opened the bridge on May 2nd, 1859. Among the public buildings are the church of St. Nicholas and St. Faith, the Guildhall and several charitable institutions and convalescent homes. In the 17th century the town's Parliamentary representatives included Clarendon the historian (1640) and Edmund Waller the poet (1685). Two hundred years after this latter date, Saltash received its new charter of incorporation, its first dating from the reign of John. Pop. (1901), 3,357.

Saltburn, a watering-place of the North Riding of Yorkshire, England, 19 miles N.W. of Whitby. The town is built on the cliffs, 150 feet above the sea, but there is communication with the beach by means of carriage roads and an

inclined tramway. Owing to the salubrity of the climate the town has acquired great popularity as a health and holiday resort, the firm sandy beach stretching for several miles to the mouth of the Tees. Besides brine and swimming baths there is a mineral spring, the water of which is said to possess properties not unlike those of Harrogate springs. Pop. (1901), 2,578.

Saltcoats, a town in the Cunninghame division of Ayrshire, Scotland, $1\frac{1}{2}$ mile S.E. of Ardrossan. It is in growing repute as a seaside resort owing to its facilities for bathing and the golf links. The public buildings include the parish church, the Roman Catholic Church of Our Lady, Star of the Sea, the town hall in immediate proximity to the picturesque old town hall, and the Mission Court House. Originally made a burgh in 1528, it was almost on the point of extinction when, in 1686, several large salt pans were built. The industry thus created flourished till the repeal of the salt duty in 1827, when it gradually expired. A magnesia works, opened in 1802, and conducted in connection with the salt pans, was the first establishment of the kind in Scotland. Pop. (1901), 8,121.

Salt Lake City, capital of the State of Utah, United States, at the western base of the Wasatch Mountains, near the right bank of the Jordan, 12 miles S.E. of Great Salt Lake, at an altitude of 4,240 feet above the sea. Laid out in 1847 by a number of Mormons, under the leadership of Brigham Young, the city is the headquarters of the Mormon Church, or Church of Jesus Christ of Latter Day Saints. The principal buildings are the Tabernacle, an oval structure, 250 feet long, 150 feet wide, and 70 feet high, with accommodation for 8,000 persons seated; the Temple, chiefly used for ceremonials and worship (baptism, marriage, prayer); the Assembly Hall to seat 3,000 persons; the University of Utah; the Museum, and the Zion's Co-operative Mercantile Institution. The city is a distributing rather than a manufacturing centre, and the industry of its people has made the surrounding wilderness to blossom like the rose. Pop. (1870), 12,854; (1900), 53,581.

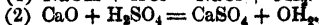
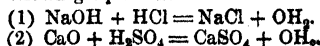
Salton, or **SALTOUN**, a parish of Haddingtonshire, Scotland, on the Tyne, some 6 miles S.W. of Haddington. It lies chiefly in a fertile valley on the northern flanks of the Lammermoors. The church, a cruciform structure with a tower and spire, was the first benefice of Gilbert Burnet, the historian, who became Bishop of Salisbury in 1689. He used here the only copy of the Book of Common Prayer alleged to have existed in the Church of Scotland during the reign of Charles II. To the parish he bequeathed his library and an endowment fund for teaching, clothing, and apprenticing thirty poor children. Andrew Fletcher, his pupil, the patriotic if perfervid antagonist of the union with England, was born in Salton in 1685, and is less remembered for his patriotism than for his much admired pronouncement, "I knew a very wise man, so much of Sir Christopher's sentiment, that he believed if a man were permitted to make all the ballads, he need not care who should make

the laws of a nation." Salton is famous as the place in Scotland where pot-barley was first manufactured, and the first place in the United Kingdom where the weaving of hollands was established, both industries being introduced from the Netherlands in or about 1710. It was also associated with the earliest bleachfield, paper mill, and starch factory, and with the invention and improvement of agricultural implements. Pop., 481.

Saltpetre. [NITRE.]

Salt Range, a hill system in Rawalpindi, Punjab, India. The main chain begins at the hill of Chel (3,701 feet), and runs westwards in two parallel ridges, with a slight trend towards the south, culminating in Sakeswar (5,010), its highest point, near the left bank of the Indus. Between the ridges lies an elevated and fertile tableland picturesquely broken by gullies and peaks. The beds of salt which give the range its name occur as solid rock on the flanks of the tableland, form the largest deposit in the world and are practically inexhaustible. They are quarried at several points. Coal of inferior quality, consisting of a brown lignite difficult to light, and other more valuable minerals are also found. The scenery, in parts rugged and sublime, in parts bleak and barren, is wanting in the softer element of romantic beauty.

Salts. When an acid is gradually added to an alkaline substance the characteristic properties of the latter are slowly destroyed, those of the acid also disappearing, until finally a compound is obtained which possesses neither acid nor alkaline properties. Such compounds are termed salts. As many compounds which do not show alkaline properties also neutralise acids, a more complete statement is that bases and acids by uniting together form salts. Such a reaction is expressed by the following equations:—



It is seen that in the salts the hydrogen of the acid is replaced by the metal present in the base, so that in constitution salts are compounds formed from acids by the replacement of the hydrogen by a metal. Certain groups of elements (*e.g.*, ammonium, NH_4) also behave as metals in this respect, forming salts, as ammonium chloride (NH_4Cl). In many acids, however, there is more than one atom of hydrogen present in the molecule. In such cases the hydrogen may or may not be completely replaced by the metal. In the former case the resulting salt is known as a normal or neutral salt —*e.g.*, normal sodium sulphate (Na_2SO_4). If the replacement be incomplete acid salts result, as *e.g.*, acid potassium sulphate (HKSO_4). These are also known as hydrogen salts, as dihydrogen sodium phosphate (H_2NaPO_4). In some salts also there is present a greater amount of the base than is necessary to combine with the acid, and we hence obtain basic salts. The term salt, or common salt, is applied popularly to the chloride of sodium (NaCl) [SODIUM], and was the original significance, the general term being due to an after-extension of the

meaning. In ordinary language and in medicine the term **salts** also is given to Epsom salts or sulphate of magnesium ($MgSO_4 \cdot 7OH_2$). A number of compounds also are known under such names as salts of lemon, salts of sorrel, etc. Smelling salts consist of carbonate of ammonia (which has a strong odour of the latter), usually mixed with some perfume, as lavender, etc. In organic chemistry compounds strictly analogous to salts are abundant in which certain hydro-carbon radicals play the part of the metal. They are usually known as ethereal salts or as esters.

Saltwort, a name strictly applied to *Salsola Kali*, a British seaside plant belonging to the order Chenopodiaceae, but often extended to the allied genus *Salicornia*. They take the name from growing upon "saltings," and were formerly largely used in the preparation of the ash known as barilla, an impure sodium carbonate used in the manufacture of glass and of soap, but now in the main superseded by the introduction of soda made from common salt.

Salvador, a republic of Central America, bounded on the N. and N.E. by Honduras, on the S.E. by the Gulf of Fonseca, on the S. by the Pacific, and on the W. by the Rio Paz and Guatemala. It occupies an area of 7,225 square miles. The coastal land is moderately level, but the interior is mountainous. Several of the peaks have been in volcanic activity within the historic period, and Izalco has continued active almost since its formation in the 18th century. Lake Guijar, near the Guatemalan boundary, is 15 miles long by 5 miles broad and, at its eastern end, discharges the Lempa, the longest river, which, pursuing a south-easterly direction, falls into the Pacific after a course of about 130 miles. Lake Ilopango, 5 miles E. of San Salvador, is 9 miles long and 3 miles broad. The volcano which formed in its basin in 1880 has almost exhausted itself. The mineral wealth comprises gold, silver, copper, iron and mercury, attention being principally bestowed on the gold. The soil is fertile, and cultivation has been carried to a high degree of perfection. The chief crops are coffee, indigo, sugar, cotton, tobacco and rubber. The larger towns are San Salvador (59,540) the capital, Santa Ana (48,120), and San Miguel (24,768). When the Central American Federation was dissolved in 1839, Salvador became an independent republic. The government consists of a president, elected for four years, assisted by a ministry of four members, and a Congress of 70 deputies. Education is free and compulsory, and justice is administered by a supreme court and subsidiary and local courts. The country received its name from Pedro Alvaredo, who reduced it for Spain in 1525-6, but the Spanish yoke was not thrown off till 1821. Pop. (1901), 1,006,848.

Salvage, the compensation allowed to persons by whose assistance a ship or boat, or the cargo of a ship, or the lives of the persons belonging to her, are saved from danger or loss in cases of shipwreck, derelict, capture, and the like; and a salvor is he who renders such assistance. The assistance must

be voluntary, and not under any contract or duty, and must involve skill, enterprise, and risk on the part of the salvors (see the Merchant Shipping Act, 1854). The right to salvage may be forfeited, either totally or partially, by misconduct on the part of the salvors, but the evidence of misconduct must be conclusive. A towing-ship, if it render salvage services, will be entitled to salvage reward like any other ship. Similarly, one of the vessels that have been in collision may, if the innocent party, be entitled to salvage for services rendered to the other party, but not if both ships were equally at fault.

Salvation Army, a religious society, having for its objects the conversion of unbelievers and the reclamation of the outcast. It had its origin in the Christian Mission started in the East End of London in 1865 by the Rev. William Booth (b. 1829), who had previously been a minister of the Methodist New Connection Church. Appalled at the widespread destitution in the East End, he devoted himself henceforth to its relief no less in a physical than in a spiritual sense. In 1878 he adopted for the large band of followers he had gathered the semi-military organisation of General, Chief of the Staff, commissioners, colonels, brigadiers, majors, and other commissioned and non-commissioned

officers, becoming himself the first General. In assuming the name of Army and the military model, it is probable that he was guided by his intimate knowledge of human nature; but whatever the motive, the efforts of the founders were rewarded with an extraordinary degree of success. The Army appeared to reach all grades of society with equal facility, but showed unusual skill in winning the confidence and support of the residuum. It aimed at introducing greater human interest into its services by the lavish use of brass bands, processions with ban-



UNIFORMS OF PRIVATES OF THE
SALVATION ARMY.

(Photo : Pictorial Agency.)

ners and lively music. It encouraged plenty of open-air preaching and, not abating a single jot or tittle of its pronounced Evangelical or Calvinistic doctrines, was soon identified with the mission of Blood and Fire in which it rejoiced. Socially the ramifications of the Army's propaganda are extensive and complex. It received an exceptional impetus from the publication in 1890 of

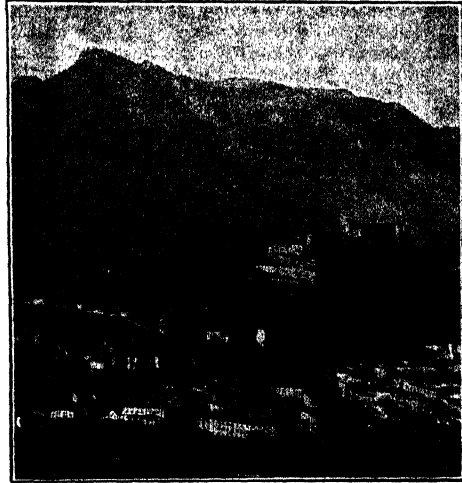
General Booth's *In Darkest England and the Way Out*, and the schemes he formulated in connection therewith impressed public opinion favourably. The Army has established farm colonies, labour factories, shelters, and a variety of other institutions. Having vigorously-conducted branches in every country of the globe, most of which were visited by General Booth in person, the Army was enabled to handle the question of emigration with unusual effect. Its literature, militant and other, in the shape of weekly papers, monthly magazines and books, is estimated to have an annual circulation in excess of 50,000,000 copies. The Army's headquarters are in Queen Victoria Street, London. An organisation that numbers its officials and employes by tens of thousands and its adherents by the million, and has the experience of large sums of money, can scarcely escape calumny; but on broad grounds, and after making due allowance for the magnitude and difficulties of its task and mission, public confidence has not been withdrawn from the Salvation Army.

Salvini, TOMMASO, actor, was born at Milan, Italy, on New Year's Day, 1829, and educated at Florence. At the age of fourteen he took to the stage, and his first engagement was with Madame Ristori's company, his early performances giving a promise that was soon fulfilled. His career was interrupted by the Italian War of Independence, through which he served, but he was afterwards enabled to resume his profession with greater success than ever. His fine presence and *physique* no doubt helped him, but part of his triumph as an actor was due to his intuitive gift for knowing just how far idealism should be carried. He was the most famous "Othello" on the contemporary stage, and other noteworthy impersonations were "Paolo" in *Francoesca da Rimini*, "Egisto" in Alfieri's *Merope*, and the more conspicuous heroes of Shakespeare and Corneille. In 1895 he published a volume of reminiscences (*Ricordi, Aneddoti ed Impressioni*), and in 1902 took part in the celebration of Adelaide Ristori's eighty-first birthday.

Salwin, or **SALWEEN**, the principal river of Burma, with a mainly north and south course. Its head-waters have not been fully explored, but its source is believed to be near that of the Irrawaddy in the Eastern Himalaya, though it may yet be found to rise farther north in the south-eastern region of Tibet. After traversing the Chinese province of Yunnan and the Shan and Karen States, the Salwin enters Lower Burma, and from this point it runs almost due south to the sea, into which it falls by two mouths, the northern flowing past the old town of Martaban, the southern passing Maulmain and reaching the sea at Amherst. It is a noble river, but rendered useless for navigation in consequence of the formidable rapids in the lower reaches. Long passages are utilised by native craft, however, and enormous quantities of teak are floated down to Maulmain for export. The timber is dragged by elephants into the forest streams, marked, and borne in flood into the main river. Some sixty miles above Maulmain the logs are intercepted by ropes stretched across the river and rafted. They are then identified, the owners pay-

ing the salvage dues. The length of the Salwin has not been ascertained definitely, owing to the doubts as to its source, but according as this is limited to the Himalaya or extended to Tibet, the length may be stated at from 800 to 1,700 miles.

Salzburg, capital of the province of Salzburg, Austria, beautifully situated on both sides of the



SALZBURG.

(Photo: Frith & Co., Reigate.)

Salzach, at the mouth of a valley at the foot of the Austrian Alps, with a fertile plain to the west and south, 157 miles W.S.W. of Vienna. The chief manufacture is hardware. This city was the birth-place of Mozart. The principal buildings include the fine Renaissance cathedral; the Romanesque church of St. Peter; St. Sebastian's with the tomb of Paracelsus; a palace in the Italian style in the Residenz Platz; the Neu Bau containing the Government offices and law courts; the archiepiscopal palace in the Capitel Platz; the Mirabell palace, once the summer residence of the prince archbishops, presented to the city in 1867 by the Emperor Francis Joseph; the Summer Riding School, formerly an amphitheatre; the Carolino-Augustum Museum; the Theological Seminary; occupying the buildings of the university suppressed in 1810; and, most imposing of all, the grandly-situated citadel of Hohen-Salzburg, founded in the 9th century, but rebuilt in 1496-1519, the towers rising 400 feet above the city. Pop. (1900), 33,067. The crown-land and province of SALZBURG is an irregular triangle intruded into on the west by the south-east corner of Bavaria, the capital city lying near the apex to the north, and the main ridge of the Austrian Alps forming the base to the south. It is surrounded by the provinces of Upper Austria, Styria, Carinthia, and Tyrol, and (as already said) the kingdom of Bavaria. It occupies an area of

2,767 square miles. The surface being extremely mountainous, the area under cultivation is small. The chief mineral is salt. The see was secularised in 1802-3, but in former times the archbishops were prominent among the princes of the Holy Roman (German) Empire. Napoleon gave the territory to Austria in 1805. Pop. (1900), 192,763.

Salzkammergut (literally, "salt-exchequer-property"), a celebrated mountainous region in the south-west of the province of Upper Austria, between Styria on the east and Salzburg on the west. Its area occupies some 250 square miles. Owing to the grandeur of the Alpine scenery, the idyllic beauty of the lonely lakes, and its lying off the beaten track, it is a favoured haunt of tourists "in the know." The chief lakes are Traunsee, Hallstättersee, Altersee (the largest in Austria), Mondsee and Sankt Wolfgangsee. The principal eminences are Dachstein (9,830 feet), Thorstein (9,666), the Todten Gebirge (Priel, 8,248), Schafberg (5,840), and Traunstein (5,548). Gmunden (pop., 7,126) on Traunsee is the capital of the region, but Ischl (9,646) is the most fashionable watering-place, having a complete equipment of baths. Salt-mining is the leading industry, the most important works being found at Ischl, Gmunden, Hallstatt, Traunkirchen, Aussee, Ebensee, Gosau and Mondsee. Cattle-rearing and forestry are also carried on. Pop. (estimated), about 19,000.

Samarra, a dry winged syncarpous fruit. It may be single, as in the ash, elm, or birch; or



SYCAMORE LEAVES WITH
SAMARA.

double, or rarely triple, as in the maples, and the wings may be lateral or almost all round the seed-cavity. Though the double samara breaks in half

it does not, whether double or single, split so as to disclose its seeds. The wing serves to disperse the contained seed away from the shade of its parent plant, those of the sycamore spinning round in the wind when falling from the tree like a screw-propeller, the shape thus being excellently adapted to secure this end.

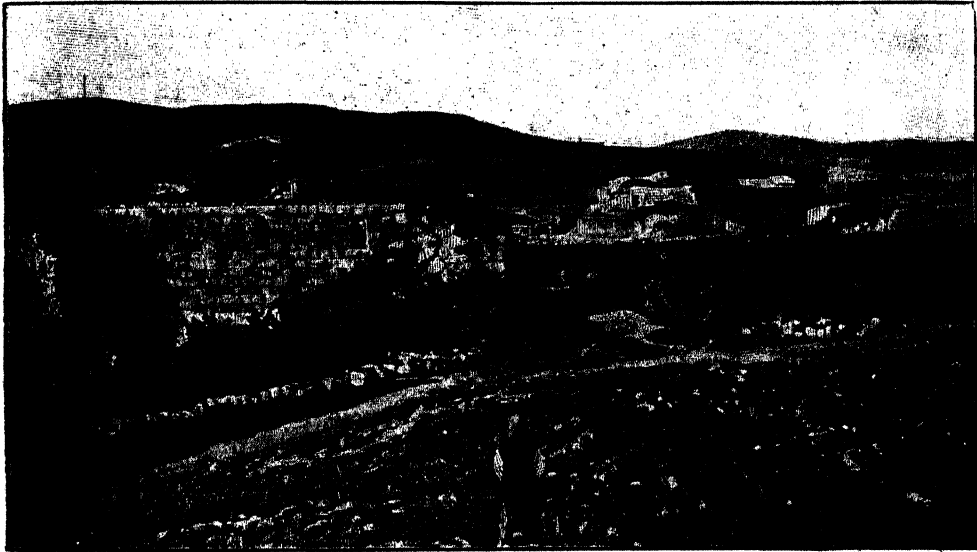
Samara, a government of South-Eastern Russia, bounded on the N. by Kazan, on the W. by Simbirsk and Saratoff, on the E. by Ufa and Orenburg, on the S. by Astrakhan, the Kirghiz Steppes and the territory of the Ural Cossacks. It occupies an area of 58,320 square miles. In the north the surface partakes of the character of flat hills and tablelands, in the south it is mainly low-lying steppe. The Volga flows on its western border, and the Samara, one of its tributaries, is the chief stream. The principal crops are wheat, rye, oats, barley, tobacco and oil-seeds. Gardening is largely pursued, and sunflowers and water-melons are cultivated in fields. The raising of live-stock is an important industry, horses especially being reared in great numbers. Bee-keeping and poultry-farming are being increasingly pursued. The manufactures, mostly flour, leather, soap, candles and spirits, are only in course of development. The capital, Samara (91,672), is situated on the left bank of the Volga. Pop., 2,763,478.

Samarang, a seaport of Java, capital of a residency of the same name, on the north coast, near the mouth of the Samarang, 260 miles E. by S. of Batavia. The principal buildings are the town hall, military school, law court and hospital. It does a great export trade in the produce of the fertile hinterland, especially coffee, pepper, indigo, rice, sugar and tobacco. Pop. (1901), 89,286.

Samarra, a city of Palestine, 35 miles N. of Jerusalem, which gave its name to the district between Judæa and Galilee. It was founded by Omri, about 922 B.C., and became the capital of the kingdom of Israel. About 725 B.C. Shalmaneser, King of Assyria, besieged it, and though he died before his conquest was achieved (722), his successor replaced the inhabitants by Assyrian settlers, many of whom were converted to the worship of Jehovah by a priest of the tribe of Levi. When the temple at Jerusalem was rebuilt, the Samaritans offered to aid the Jews, but met with a refusal, which led to bitter religious animosity between Samaritans and Jews, in which the former were usually the aggressors. Sir Charles W. Wilson says they were ready enough to acknowledge kinship with the Jews when the latter were prosperous, but at other seasons they ignored the relationship and maintained their Assyrian descent. It was in consequence of this mutual hostility that Jesus forbade His disciples to enter any city of the Samaritans. John Hyrcanus destroyed the city, as well as the Samaritan temple on Mount Gerizim, near Sichem, in 129 B.C. It was soon rebuilt, and, under Herod, acquired some importance, but has since dwindled into a mean village.

Samaritans, a small Israelitish community of Nablus (Neapolis, Sichem) at the north foot of the sacred Mount Gerizim, Samaria. They claim direct descent from the old Israelitish inhabitants of Palestine, and profess a primitive form of the Hebrew religion, as embodied in a very ancient version of the Pentateuch in a Semitic language formerly current in Samaria, but modified by numerous Hebrew and Aramaic elements, and written in a Phœnician script which appears to have been in use in Palestine under the Maccabees. The MS., which is of great age, is preserved at Nablus with some other venerable documents. The Samaritans rigorously observe the prescriptions of the law, are strict Sabbatarians, and still offer sacrifices on Gerizim according to the rites or-

hara on the S. and W. The surface is mostly desert in the north, but in the south is mountainous. It covers an area of 26,627 square miles. The chief river is the Zerafshan. Agriculture, which is in an advanced state, is the leading industry. The principal crops are wheat, rice and barley, but millet, peas, lentils, flax, hemp, poppy, madder, tobacco, and melons are also cultivated. Sericulture and cotton-growing have been successfully introduced. The raising of live-stock is, the main occupation of the Kirghiz. The manufactures are almost entirely connected with villages, such as weaving, saddlery, boot-making, tanning and metal-working, but a few distilleries, flour-mills, glass works and cotton-cleaning works are found in the towns. Pop. 857,905.



SAMARIA.

[Photo: Bonfilis.]

ained in Leviticus and Deuteronomy. They also, like the Jews, await the Messiah, who is to descend on the holy mountain, rival of Zion, and lead the faithful into everlasting bliss; but in the meantime the faithful are dying out. They are reduced to between 100 and 200 persons, the small number of the families left being the subject of local proverbs. Though they apparently entertain no objection on religious grounds to marriage with neighbouring Jewish families, they will not consent to such unions, which afford, it is said, the only prospect of the continuance of their race. Possibly, however, this may be a pessimist view, since the people, it may be supposed, would not willingly consign themselves and all their dreams and hopes of glory to annihilation.

Samarkand, a government of Russian Turkistan, Asia, having Ferghana on the E. and Bok-

Samarkand, the capital of the preceding government, 5 miles from the left bank of the Zerafshan. It is divided into the old or native quarter and the new or Russian quarter, the latter laid out since 1871. The mosque of Shah Zindeh, one of the finest in Central Asia, is situated outside of the town walls. The principal buildings are the mosques, colleges and citadel. The town is of great antiquity, the ancient city Marcanda having been destroyed by Alexander the Great. Under the Arabs, who subdued it early in the 8th century, it reached a high degree of civilisation. Tamerlane made it his residence, and since it contains his tomb the town is regarded with reverence. One invader after another reduced it to ruin, but in the 18th century it showed signs of returning animation and is now the emporium of a large and diversified trade. It has a fine climate and beautiful environs. Pop. (1900), 58,194.

Sambourne, EDWARD LINLEY, artist, was born in London on January 4th, 1845, and educated at the City of London School and Chester College. He was apprenticed, at the age of 16, to Messrs. Penn and Son, the well-known engineers at Greenwich; but being encouraged by Mark Lemon, the editor, to become a contributor to *Punch*, he submitted a drawing in 1867, and since that date his work has constantly appeared in its pages. He has illustrated a large number of books, including the *New Sandford and Merton* (1872) and Charles Kingsley's *Water Babies* (1885). In 1900 he was appointed one of the Royal Commissioners and sole juror for Great Britain in Class 7 (black and white) of the Fine Arts, Paris Exhibition, and on January 1st, 1901, succeeded Sir John Tenniel as the leading cartoonist for *Punch*. Though to some extent lacking his great predecessor's classical

lord and is of a yellowish hue. The Sambar prefers stony hills, where there is abundance of cover and ready access to water. They browse rather than graze, and their habits are nearly nocturnal. During the day they seek shady retired places, the old stags being particularly difficult to find, retreating to spots where only experienced hunters would think of looking for them, and even the old shikari has to trust quite as much to luck as to his knowledge of woodcraft.

Samnites, people of ancient Italy, who inhabited Samnium (i.e., Sabinum), which bordered on Campania and Apulia. They were originally a band of Sabines who emigrated earlier than the foundation of Rome, conquered the original Opicians and adopted their language. Their warlike nature and love of freedom made them formidable enemies



ROBERT LOUIS STEVENSON'S HOUSE, "VAILIMA," SAMOA. (From photograph supplied by Mr. Stevenson.)

refinement—which, apart altogether from any question of *technique*, has a unique value in the art of the political cartoonist—Linley Sambourne has nevertheless produced several effective and memorable pictorial comments on public affairs. A master of invention and design, his skill in these branches has been repeatedly requisitioned on special occasions with the happiest results, as in the diploma for the Fisheries Exhibition (1883) and the W. E. Gladstone memorial card.

Sambar, or GEROW (*Rusa Aristotelis*), a deer found in great numbers throughout the hill districts of India. The stag, a massive creature, stands nearly five feet high, is of a deep brown colour, with the hair of the neck developed almost into a mane, and has a fairly long tail. Its antlers are of the rusine type, present three points, and are over three feet in length. Above the brow antler the beam forks high up into two pretty equal branches, like a great catapult. The hind is less massive than her

of the Romans. The first Samnite War—undertaken by the Romans in aid of Campania—began in 343 B.C., the second in 327 B.C. In 321 the Samnites, aided by neighbouring tribes, gave the Romans a severe check, but in 290 B.C. Roman supremacy was established. In 90 B.C. a revolt of the Samnites was followed by an almost universal massacre, and their career as a nation was ended.

Samoa, or NAVIGATOR'S ISLANDS, a group of islands in the South Pacific, between 13° 25' and 14° 30' S. and 168° and 173° W. They are 14 in number, the largest being Savaii (660 square miles), Upolu (340 square miles), Tutuila (54 square miles) and Manua (25 square miles). The total area may be estimated at 1,100 square miles. They are mountainous and covered with rich tropical vegetation. Copra is the principal product. The natives are Christianised Polynesians of fine *physique*, pleasant appearance, decided mental capacity and good behaviour and are born sailors. To adjust con-

flicting interests of the Great Powers which had become interested in the South Seas in the last quarter of the 19th century, a conference at Berlin led up to a treaty (1889) guaranteeing the neutrality of the islands, recognising the right of the natives to follow their own laws and customs and to elect their king, and reserving to the three signatory Powers—Great Britain, Germany, and the United States—equal rights of trade and residence. Friction ultimately arose, due partly to rival claimants for the kingship and partly to dissensions secretly fomented by interested Powers, and in 1899 the kingship was abolished. Great Britain renounced all rights over the islands in favour of Germany in respect of Savaii, Upolu, Apolima and Manono, and in favour of the United States as regards Tutuila, Manua, and other islands. Apia, in Upolu, is the capital of the German section, and Pango-Pango in Tutuila of the American. To all lovers of literature the islands and the natives must always possess a deep interest for the sake of Robert Louis Stevenson, who built for himself a house ("Vailima," from which so many delightful letters were addressed) in the hills above Apia, where he died in 1904. He had endeared himself to the natives by many delicate attentions, and his Samoan "boys" bore their master's remains to their resting-place on the summit of the mountain of Vaea. Pop. (1900), 38,412 (Upolu, 18,341; Savaii, 13,201; Tutuila, 3,800).

Samos, an island of the Greek Archipelago lying near Cape St. Maria in Asia Minor, 42 miles S.W. of Smyrna, forming a principality under the sovereignty of Turkey under the guarantee of France, Great Britain and Russia (December 11th, 1832). It covers an area of 180 miles, measures 27 miles from east to west and 10 from north to south. Its earliest inhabitants are said to have been Carians and Leleges, but it was colonised by Æolians from Lesbos and Ionians from Epidaurus. The Ionian element soon predominated, and the island was a powerful member of the Ionic confederacy. It acquired considerable maritime power, planted colonies in Asia Minor, Thrace, Crete, Sicily, and Italy, and, under the tyrant Polycrates, established an extensive trade with Egypt and Cyrene. It became subject alternately to Persia and Athens, until it was nominally attached to the Græco-Syrian monarchy. It joined Mithradates against Rome, and consequently was absorbed in the Roman Empire in 84 B.C. The island became tributary to Arabs, Venetians, Genoese, and eventually to the Turkish Empire. In the early period of Hellenic history Samos was famous for the cult of Hera (Juno), for art, and in particular for the invention of casting in bronze, and generally for the highest Ionian civilisation. Towards the end of the Peloponnesian War this island became the asylum of the democratic party of Athens. From 1821 to 1824 the Samians maintained a successful resistance against the Turks. In the 5th century B.C. the capital city (Samos) was one of the finest cities of the world, and extensive ruins still mark its site. Its surface is mostly mountainous and in Mount Kerki reaches a height of 4,725 feet. There is abundance

of forest land and the valleys are very fertile. The mineral wealth includes antimony, silver-lead, manganese, copper, zinc and marble, but, excepting the quarrying of marble, there is scarcely any mining. The chief crops are grain, carobs, tobacco and grapes, and the manufactures comprise wine, brandy and oil, while raisins are largely exported. Pop. (1902), 53,424, almost wholly adherents of the Greek Orthodox Church.

Samosata (modern SAMSAT), a village of the province of Aleppo, Turkey in Asia, on the right bank of the Euphrates, 150 miles E.N.E. of the Gulf of Iskanderun, an arm of the Mediterranean. The present village occupies part of the site of the famous city which was the capital of the Syrian kingdom of Commagene and the birthplace of Lucian, the Greek humorist and writer of dialogues, and Paul of Samosata, the forerunner of the Unitarians. The scanty remains of the ancient walls, an aqueduct and a castle are all that is left, apart from the pages of history, to recall a famous past.

Samothrace, or SAMOTHRAKI, an island in the Ægean Sea, belonging to Turkey, 16 miles N.N.W. of the island of Imbros and 22 miles S.W. of the mainland, where the Maritza falls into the sea. It has an area of about 30 square miles and is of oval shape, the longer axis running from east to west. It is mountainous, the highest point being 5,240 feet above sea-level. In ancient times it was noted for the worship of the Cabiri, a primitive cult the rites of which are supposed to have drawn many people to the island, but the nature of which can only be guessed at. Since, however, this cult is conjectured to have been concerned with the worship of Castor and Pollux as divinities who protect those in peril on the sea, the mysteries were probably of an unobjectionable character. The Samothracians lent Xerxes some assistance in his invasion of Greece, and their ships took sides with the Persian fleet at the battle of Salamis in 480 B.C.—scarcely a notable emergence from the general obscurity in which their history is wrapped. Smyrinese fishers fish for sponges off the coasts. Pop. (estimated), 5,000, mostly Christians.

Samoyedes, a main division of the Ural-Altaic family, closely allied in speech to the Finnish branch. Their original home appears to have been the district about the sources of the Yenisei river, west of Lake Baikal, where they are still represented by the Soyot people, and whence they have spread as breeders of reindeer to the shores of the Frozen Ocean from the White Sea to Chatanga Bay. The chief tribes are the Yurak, Taguri, Ostyak, Abator and Koibal, with a total population of about 20,000. They are of coarse Mongolian type, low stature, squat ungainly figure, long jet-black hair, scant beard, broad flat features, high cheek-bones, long narrow and slightly oblique eyes and dirty-yellow complexion. All are nomads, fishers and hunters, living in little rectangular birchwood huts in winter (*yurts*), and in cone-shaped tents of birch-bark in summer (*chums*). Nominally Christians of the Orthodox Greek rite, they are still essentially Shamanists, worshipping the old stone idols and

believing in the good and bad principles (*Sam-nem* and *Vetako*). Despite their wretched savage existence, they possess a rich oral literature, myths, folklore and songs, many of which have been collected by Castrén. Everything points to the fact that they are another unfortunate race for whom, so civilisation has decided, the world has no room.

Sapphire, a succulent umbelliferous plant (*Crithmum maritimum*), growing on rocky sea-coasts whence it was originally known in French as *perce-pierre*. This was corrupted to Saint Pierre, whence the English name is derived. Its flowers are greenish-yellow, and its leaves are bi-ternate. These last are gathered, before the appearance of the flowers in June, for pickling, and were formerly valued as a digestive. The plant occurs on most European coasts, just above high-water mark. Its collection for pickling is alluded to in *King Lear* (act iv. scene 6).

Samson, the liberator of Israel, was of the tribe of Dan, and was born at Zorah (the modern Surah), a town of Judah, in 1155 B.C. His many exploits are recounted in the Book of Judges, since he officiated as a judge for twenty years. His strength lay in his hair, and Delilah betrayed him into the hands of the Philistines by cutting it off. He was taken into the temple of the god Dagon, and pulled the edifice down on himself and his enemies in the year 1117 B.C. Modern commentators incline to the opinion that Samson cannot be regarded as a leader, or judge, so much as a popular hero, renowned for his strength and his mother-wit, not unaware of his Divine mission, but sweeping to his revenge on the Philistines in all the fighting spirit of a mere man.

Samuel, judge and prophet of Israel, was the son of Elkanah of the tribe of Levi, and was born about 1155 B.C. He was made a judge when he was about forty years of age, as related in the Scriptures, and consecrated Saul. The latter angered him by sparing the Amalekites on one occasion, and he warned him of the evil consequences of showing mercy to the enemies of the Lord. Samuel consecrated David afterwards, and died in the year 1057 B.C. He is supposed to be the author of the Book of Judges in the Old Testament and also of the First Book of Kings.

Samuel, BOOKS OF, received this name at the time of making the Septuagint translation, previous to which they, or rather it (for the Hebrew MS. is one), was called the Book of Kings. The first part deals with the history of Samuel, and the latter with that of Saul and David, who were appointed by Samuel. Generally they may be said to give the history from Eli to the death of David, and may have been begun by Samuel, and perhaps continued by Gad, Nathan, and later writers.

Samurai, a word applied either collectively to the military class or individually to a soldier of the *ancien régime* in Japan. When the revolution of 1867 was fully accomplished, the feudal system perished, and six years later the Samurai were disbanded. They did not relinquish their privileges without a struggle, especially that which gave them

the exclusive right to wear a sword, a custom that in course of time had come to be accepted as the badge of a "gentleman," as distinguishing the wearer from an ordinary man. Indeed so keenly did many Samurai feel the new ordinance that in 1876 they rose in rebellion. The Government, however, was prepared, and had no difficulty in suppressing the rising. The Samurai were the scholars as well as the fighting men of Japan. In the earlier period of their existence they cheerfully accepted a life of Spartan discipline, including the "happy despatch" or disembowelment, but growing luxury and overweening pride ultimately demoralised the bulk of them, and they became both a burden and a nuisance to the nation. The Samurai carried at least two swords, a long one and a short one, stuck in his girdle (not slung from his person), and in action might cumber himself with five, one of which, in the event of defeat, was reserved for his own suicide.

Sana, or SANAA, capital of Yemen, Arabia, situated in a valley at a height of 7,800 feet above the sea, 100 miles N.E. of Hodeida on the Red Sea, and 190 miles N. by W. of Aden. Its walls are nearly six miles in circumference. The principal buildings are mosques, baths and caravanserais. There is a considerable trade in coffee, and the manufactures include arms, jewellery and silks. In 1872, during the Yemen rebellion, the town was besieged and captured by the Turks, who have established an apparently permanent occupation. Pop. (estimated), 50,000.

San Antonio, the capital of Bexar county, Texas, United States, on the San Antonio, which here receives the San Pedro, 80 miles S.W. of Austin. The principal structures are the cathedral of San Fernando, the Federal building, the courthouse, St. Louis College, and the Church of the Alamo, part of an old Franciscan mission, which is historically interesting in connection with the Texan war of independence in 1836, when a garrison of 175 men defended it for twelve days against an overwhelming force of 4,000 Mexicans, and died to a man rather than surrender. The surrounding country is fertile, and its leading products are cattle, cotton, wool and hides. In these the town drives a brisk trade, while the stock markets of cattle, horses and mules are the largest in the State. The chief industries are iron-founding, brewing, and milling of flour. Fort Sam Houston, a mile to the north, is one of the most important military stations in the Union. As a health resort San Antonio is in growing repute, its climate being well adapted to sufferers from lung complaints. Pop. (1900), 53,321.

Sanatoria, OPEN-AIR, structures not necessarily of a permanent character, and indeed preferably of wood, adapted to the treatment of consumptives. The vast improvement, and in some cases cures, alleged to have resulted from the system of treatment adopted at Nordrach in the Black Forest—which consisted of forced feeding and an open-air life—drew attention to the need for reconsidering the stereotyped treatment of

phthisis. One result was to develop, almost indefinitely, the open-air treatment. With this object substantially-built wooden huts have been erected in various localities, the structures being readily movable, either as a whole or by working on a pivot, so that a sheltered position from the day's wind may at once be obtained. In other respects the sanatoria are open to the air, in all weathers and at all hours. The patients are encouraged to go out in all weathers, the fundamental rule being always to change the clothing in rainy weather and never, in wet or dry, to allow the feet to become cold. In other respects, as regards bed-clothes, personal clothing and the like, the patient's comfort may be studied, so long as every precaution is taken against cold and chill. That is why woollen clothing is desirable, and why the bed-clothes should be abundant. Cases are treated on these lines even in mid-winter. The questions of food and drink are, of course, regulated by the doctor's dietary. The whole method of treatment, however, is still in the experimental stage.

Sanchuniathon, a somewhat shadowy Phœnician historian, who is said to have lived in the 2nd or 3rd century before Christ. The literature of Phœnicia had perished before advancing Greek thought and energy, and was considered irrecoverable. Sanchuniathon was cited by Porphyry when he attacked the Mosaic account, and Philo Byblius, who had translated into Greek the fragments known as *The History of Phœnicia* and assumed to be Sanchuniathon's, vouched for their authenticity. Philo's character for honesty was considerable, but many scholars believe the work to be a forgery. Philo says Sanchuniathon was a native of Berytus, and lived in the reign of Semiramis. That such a writer existed seems clear, his name being held in reverence in ancient times, but there is grave doubt as to his *History*, which would be of immense importance if quite genuine. Philo may either have worked upon some real fragments of Sanchuniathon's writing, or he may himself have been deceived by a forger.

Sancroft, WILLIAM, Archbishop of Canterbury, was born at Fressingfield, in Suffolk, on January 30th, 1617, and was educated at Bury St. Edmunds Grammar School and Emmanuel College, Cambridge. After filling several posts at his college and travelling on the Continent, he became rector of Houghton-le-Spring and King's Chaplain (both in 1661) and prebendary of Durham in 1662. He was made Dean of York in 1664, and later in the same year Dean of St. Paul's, and in 1677 was raised to the see of Canterbury. He was a man of much power and great obstinacy, and was one of the Seven Bishops who were sent to the Tower for drawing up the petition against the illegalities of James II. He took a prominent part in the events which followed the flight of James and the arrival of the Prince of Orange. In 1691, for refusing to take the oaths to William and Mary, he was deprived of his see, but absolutely declined to leave Lambeth Palace. When finally obliged to retire, he returned to his native place, where he parti-

cipated in a vain attempt to preserve the succession in the Nonjuror body, and where he died in November, 1699.

Sanctuary denotes the exemption from pursuit and legal process enjoyed by certain spots or buildings, notably churches. The Hebrews had their cities of refuge, some heathen temples had right of sanctuary, and from the time of Constantine certain churches were thus privileged. The rights were modified by varying conditions, and seem to have originated in the desire to insure against an anticipation of the result of judicial process. A Papal Bull was generally necessary to constitute sanctuary, but the king's consent was in some cases enough. Sanctuary from debt was afforded by certain places in England till 8 & 9 William IV., general sanctuary having been abolished by 21 Jac. I. Holyrood with its precincts still gives immunity from debt, but the privilege has been practically of no account since the abolition of imprisonment for debt in 1880.

Sand, finely-divided quartz, with admixtures of other substances, accumulated by various agencies. The grains may be perfectly regular crystals of quartz; angular fragments freshly derived from the breaking up of granite or schist; water-worn and rounded; chemically corroded; or with a redeposited coating of silica. No sand in any quantity is formed of flint. The other constituent minerals of igneous rocks, such as scales of mica, tourmaline, epidote, garnets, cassiterite, etc., often occur in sands, as does also finely-divided shelly calcareous matter. The name "sand" is sometimes loosely applied to the ground-down coral and nullipores of the shores of the Bahamas and Bermudas. Sand may be accumulated by wind, rivers, lakes, glaciers, or the sea; and, in the absence of fossils, it is well-nigh impossible to distinguish sands that have originated in one of these ways from those originating in another. Sands are generally poor in fossils, as their porous character leads, by percolation, to the destruction of any they may contain. They are commonly stained red or yellow by oxide of iron, but may be green from the presence of glauconite; lilac from that of humus acid compounds; grey from carbonaceous matter; or bleached to silver sand by the reducing action of organic acids. Among the chief English formations of loose sand are the Trias, the Portland Sands, the Hastings (including the Ashdown and Tunbridge Wells) Sands, the Lower Greensand (including the Sandgate and Folkestone series and some of the Hythe beds), the Upper Greensand, more commonly incoherent, the Thanet Sands, and the Bagshot Sands. Sand is employed for many commercial purposes, for glass-making, for making mortar, for earthenware, for foundry-moulds, for the cultivating of ferns and for scouring, whilst it was formerly put down on brick and wooden floors. The quarries at Gilmerton, near Edinburgh, were famous for their household sand, and the carters for their fully-flavoured language.

Sand, GEORGE, novelist, was the daughter of a French military officer named Dupin, and was born

in Paris on July 1st, 1804. Her real name was Armandine Lucile Aurore Dupin previous to her marriage with M. Dudevant. She imbibed some of Rousseau's doctrines at an early age, and in 1817 entered the convent of the English Augustines in



GEORGE SAND.

(Photo: Nadar, Paris.)

Paris, where she stayed three years. Her earlier life was spent with her grandmother at Nohant in the department of Indre, and on the latter's death she married in 1822, but her wedded life was not a happy one, and her husband and she separated nine years later, she taking charge of the two children (a boy and a girl). About 1831 she made the acquaintance of Jules Sandeau, and, having previously written a little for the press, she collaborated with him in a novel, *Rose et Blanche*, which was published (1831) under the pseudonym of "Jules Sand." Her own first novel, *Indiana*, appeared in 1832 over the name of "George Sand." Having made some reputation, she devoted herself to literary work, and produced many novels in rapid succession. Having met with Alfred de Musset, she went to Italy with him, and afterwards formed *liaisons* with other famous men, especially Chopin the musician, with whom she remained eight years. During the Revolution of 1848 she was concerned in political affairs, and her pen was devoted to them rather than to novels. She died at Nohant on June 7th, 1876, having, after a period of storm and stress, settled down for a quarter of a century to the tranquillity of a country life. Her very impressionable nature was stirred by certain mystical phenomena, and she has left in many of her novels strong evidence of the religious or spiritualistic bent of her mind. *Spiridion* (1839) is especially marked by this exaltation. *Consuelo* appeared in 1842, and other novels of hers deserving of mention are *La Comtesse de Rudolstadt* (1843),

Le Moulinier d'Angibault (1845), *La Mare du Diable* (1846), one of her most beautiful productions, *La Petite Fadette* (1848), besides *Jean de la Roche*, *Mauprat*, *La Daniella*, *Histoire de ma Vie* (1854), and *Impressions et Souvenirs* (1873). Her most successful play was *Le Marquis de Villemer* (1864). The beauty of her style is one of her chief merits.

Sandal Magna, a town of the West Riding of Yorkshire, England, pleasantly situated in the valley of the Calder, 2 miles S.E. of Yorkshire. Among the public buildings are the cruciform church of St. Helen (restored 1888), partly in the Norman style, and the Taylor and Scholey Endowed School, so named after its two benefactors, Richard Taylor and Alderman Scholey. On an eminence are the meagre remnants of a castle, restored about 1320 by John Plantagenet, last Earl of Warren. It afterwards passed into the hands of Richard Plantagenet, Duke of York, who fell in the battle of Wakefield, near this spot, in 1460. The stronghold then became the residence of his son Richard, Duke of Gloucester, who ascended the throne as Richard III. The ruins of the castle and the grounds were presented to the town in 1888 for the purposes of a park. Pop. (1901), 6,843.

Sandalwood, the fragrant heart-wood of trees belonging to the genera *Santalum* and *Fusanus* of the order Santalaceæ among the Incompletæ. *S. album* of India, an evergreen from 20 to 30 feet high and having the appearance of privet, is the source of the chief supply. *S. Freycinetianum* and *S. pyrularium* in Hawaii, *Fusanus spicatus* in West Australia and other species are apparently inferior. One hundred lbs. of good sandalwood should yield from 25 to 30 oz. of a pale straw-coloured essential oil; but this, owing to its costliness, is largely adulterated. Indian sandalwood is chiefly produced in Mysore, and is worth from £12 to £40 per ton in China. It is extensively used for carving and inlaying and, wherever Buddhism prevails, for burning in funeral and other religious rites. The oil is used as a perfume, and of late years as a substitute for copaiba in treating diseases of the mucous membrane. Red Sandalwood, or Red Sanders Wood, used in dyeing and calico-printing, is the red heart-wood of the leguminous *Pterocarpus santalinus* and of the "padouk" (*P. indicus*) of the East Indies; and Barwood or Camwood, the *santal rouge d'Afrique* of the French, is that of *Baphia nitida* (*P. angolensis*) from the Guinea coast. The name is a corruption of Santal wood.

Sandalwood Island, or SUMBA, an island of the Dutch East Indies, south of the island of Flores. It is situated in 10° S. and 120° E., and has an area of about 4,400 square miles. It is noted for its valuable timber and horses of an exceptionally fine breed, both of which are exported. Pop. (estimated), 200,000.

Sandarach, the mastic-like resin which exudes from the coniferous *Callitris quadrivalvis* of the Atlas Mountains, from *C. sinensis* in China, and from *C. verrucosa*, *C. robusta*, *C. cypressiformis*, and *C. Reissii*, known as "pine gum" in Australia. It is an important ingredient in spirit-varnishes.

The wood is fragrant, hard and durable and largely used in the construction of mosques. The Morocco variety is chiefly shipped from Mogador.

Sandbach, a town of Cheshire, England, 5 miles N.E. of Crewe. Though the streets in the older quarters are narrow they are not unpicturesque and the newer parts of the town are well and substantially built. On an eminence stands the church of St. Mary in the Perpendicular style. The public buildings include the town hall and market hall, the literary and scientific institution, the temperance hall and the savings bank. In the market-place are preserved two ancient obelisks, said to belong to the 7th century, the faces of which bear crude figures and carvings of foliage. Amongst the former designs it is possible to distinguish rough representations of the birth and crucifixion of Jesus. The chief manufactures are salt, chemicals, fustian, flour, and boots and shoes, and there are brine springs. Pop. (1901), 5,558.

Sand-blasting, a method of engraving or cutting glass or any other hard substance by blowing with great violence minute particles of sand upon it. It is frequently used for engraving marble and also for sharpening files. By cutting designs of a more or less complicated description in paper, or other sand-resisting material, and laying this on the surface of the glass or substance, it is possible to reproduce the patterns with a considerable degree of definition.

Sandby, PAUL, painter and engraver, was born at Nottingham in 1725. He was employed, with his brother Thomas (1721-98), as a draughtsman to the Board of Ordnance and in this capacity travelled a great deal in the Lowlands and Highlands of Scotland, where he made a large number of sketches and pictures. Having acquired unusual facility in etching, he engraved many of his works, which included views of cathedrals, castles, towns, and mansions in different parts of the United Kingdom, besides etching the paintings and drawings of other artists. In 1768 he was appointed chief drawing-master to the Royal Military Academy at Woolwich and, in the same year, was nominated an original member of the Royal Academy. In 1775 he introduced the process of aquatint engraving, an improvement on a process employed by the French painter and engraver, Jean Baptiste Le Prince, which imitated the effect of a drawing in sepia or Indian ink. He is entitled to the high honour of being the father of water-colour art, the *technique* of which he did much to advance. He died in London on November 7th, 1809.

Sandean, LÉONARD SYLVAIN JULES, novelist and dramatist, was born at Aubusson, in the department of Creuse, France, on February 9th, 1811. He published his first novel, *Rose et Blanche*, in 1831, in conjunction with Madame Dudevant, who, taking the first half of his surname, became "George Sand." He was at that time an art student, but gave himself up entirely to literary work. He produced a great many works, the best of his novels being *Mlle. de la Seiglière* (1848),

afterwards dramatised with much success, and his most notable comedy *Le Gendre de M. Poirier*, written in collaboration with *Emile Augier*. He became Keeper of the Mazarin Library in Paris in 1853, was elected to the Academy in 1858, and was appointed librarian at the Palace of St. Cloud in 1859. He died in Paris on April 24th, 1883.

Sanderling (*Calidris arenaria*), the single species of a genus of birds of the Snipe family, in which the hind toe is absent. It breeds in the Arctic regions, visiting Great Britain in autumn and leaving late in spring. The male is about eight inches long; its nuptial plumage is rufous with black markings, but turns to ash-grey in winter; the under parts are white.

Sanderson, JOHN SCOTT BURDON, physiologist, was born at Jesmond, near Newcastle, England, on December 21st, 1828, and studied at Edinburgh University. For a time he practised as a physician, but at intervals was officially appointed to investigate the etiology of diphtheria (1858), cattle plague and cholera (1866). His researches led to his election (1874) to the Jodrell professorship of physiology at University College (1874-82). In 1883 he was appointed to the newly-established Waynflete chair of physiology at Oxford, and his lectures and laboratory work soon covered the Oxford Medical School with distinction. In 1885 he became Regius professor of medicine at Oxford, and in 1899 was created a baronet. He died at Oxford on November 24th, 1905. Sir John was President of the British Association when it met at Nottingham in 1893, and served on the Royal Commissions on Hospitals (1883), the Consumption of Tuberculous Meat and Milk (1890), and the University of London (1892-4). His best-known works are his *Handbook of the Sphygmograph* (1867), *Handbook for the Physiological Laboratory* (1873), and his *Course of Practical Lectures* (1882).

Sanderson, ROBERT, bishop and theologian, was born on September 19th, 1587, at Rotherham, Yorkshire, but Sheffield also claims to be the birthplace of the greatest of English casuists. Educated at Rotherham Grammar School, he matriculated at Lincoln College, Oxford, in 1603, and was made Fellow of his college in 1606. He was ordained in 1611, and in 1618 was presented to the rectory of Wyberton, Lincolnshire. As his health became affected there he resigned his living in 1619 for one of less value in the same county, and became rector of Boothby Pagnell, which he held for more than forty years. In the same year he resigned his Fellowship and married Ann Nelson, daughter of the rector of Haugham, a wife who, according to Izaak Walton, his friend and biographer, "made his life happy by being always content when he was cheerful; who divided her joys with him, and abated his sorrow, by bearing a part of that burden." Laud, then Bishop of London, recommended him to Charles I., who made him one of his chaplains. "I carry my ears," the king said later, "to hear other preachers, but I carry my conscience to hear Mr. Sanderson." In 1642 he was appointed Regius professor of divinity at

Oxford. During the Great Rebellion he suffered imprisonment, and being reduced to want at the time of the Commonwealth, was assisted by Robert Boyle. At the Restoration his preferments were restored, and in 1660 he became Bishop of Lincoln. He sought to know and be known by the "meanest of his clergy"; he was open-handed and restored Buckden, the episcopal residence, at his own expense. He died, "far from being rich," on January 29th, 1663. Author of the second preface to the *Book of Common Prayer*, reputed author of the "Prayer for all Conditions of Men," and of the "General Thanksgiving," his most celebrated work is *Nine Cases of Conscience Occasionally Determined*, published after his death, which is distinguished as much by its subtle reasoning as by its moral integrity. Walton dwells upon his humility and modesty. To these traits it was probably due, as much as to an infirm memory, that Sanderson was the earliest preacher who read his sermons in the pulpit.

Sandgate, a watering-place of Kent, England, 1½ mile W. of Folkestone. It is built on a range of chalk cliffs facing the English Channel and, on a clear day, commands a view of the French coast. Though lacking the flamboyant qualities of its fashionable neighbour, it is near enough to be in, if not of them, and, the climate being almost identical, its quietude has a charm of its own. To the north of the town is the important military station of Shorncliffe Camp, which was permanently established in 1854. John B. Gough, the temperance orator, laid the foundation stone of the Soldiers' Home and Institute in 1881. Henry VIII. built Sandgate Castle in 1539, and Queen Elizabeth visited it in 1573. In 1806, during the Napoleonic scare, it was thoroughly overhauled and placed in a state for action. The changes obliterated its original character, and the castle is now little more than a martello tower. Pop. (1901), 2,023.

Sand-Grouse, a small order (Pterocletes) of birds, with two genera, characteristic of the Ethiopian region and Asia. They are pre-eminently desert birds, and the plumage is protective—buff with darker markings. The wings are long and pointed, giving them great powers of flight; the legs and toes are short. They live generally in large packs, and are rather shy, being prompt to take alarm, however, and clever at escaping capture. They lie low at the approach of the sportsman, but fly off at a rapid pace should he draw too near. They feed at regular hours, assembling in droves at rivers or tanks to drink. The female lays three or four eggs of a greenish stone-colour, closely spotted with grey and brown, in a small hollow she scrapes in the sand. The male helps to supply the wants of the nestlings and, when these have reached maturity, all fly off together. Sand-grouse can be kept in captivity and are an ornament to the aviary. Their flesh is good eating when sufficiently "high," for otherwise it may be hard and tough; but young birds are delicious and much prized. The genus *Pterocles*, with about a dozen species, is represented in Europe, *P. alchata* being known in Spain as the Ganga. The genus *Syrhaptes* is

Asiatic. Pallas's Sand-grouse (*S. paradoxus*) wanders westwards at uncertain intervals in large flocks.

Sandhopper (*Talitrus locusta*), a small crustacean of the order Amphipoda. The eyes are sessile and fixed, and the last pair of limbs are converted into leaping legs, like those of the grasshopper. It is plentiful on the seashore, where it occurs between tidal limits. It usually feeds on decaying garbage, both animal and vegetable. Though it never enters the water, it would appear to need a certain amount of moisture in order to enable the branchia to perform their function. It burrows under moist seaweed and in damp sand. As a rule the young remain with their parents for some time after reaching maturity. *Orchestia*, another genus of Amphipods, also lives out of the sea, but within reach of the spray. Some species, however, in the southern hemisphere exist many miles from the coast, selecting land plants for their abode; they are found at times even at a height of 1,500 feet above the level of the sea.

Sandhurst, a parish of Berkshire, England, separated from Hampshire by the Blackwater, 4½ miles S.E. of Wokingham. The church of St. Michael (restored in 1864) is in the Early English style. There are remains of a Roman station (popularly known as Cæsar's camp), and two hills are supposed to be barrows. The Royal Military College is situated in beautiful grounds. It was first established (1799) at High Wycombe, was then removed (1802) to Great Marlow, and was transferred here in 1812. The central block of the buildings has a Doric portico with two wings, and the chapel contains memorial tablets to governors and others. The students are called "gentlemen cadets." To the north of the institution lies Wellington College, a public school founded by public subscriptions in 1853 to the memory of the Iron Duke. It was opened by Queen Victoria in 1859. It has a large number of scholarships open to the sons of deceased army officers. Pop. (1901), 2,386.

Sandhurst, the official name of which is BENDIGO, a town of Victoria, Australia, 100 miles N.N.W. of Melbourne. It is the seat of a Roman Catholic bishop and the centre of the gold-mining, grape-growing, and agricultural industries, but it also has breweries, potteries and iron-foundries. The public buildings include the Government offices, law courts and town hall. Pop. (1901), 31,020.

Sand-Martin. [SWALLOW.]

San Domingo, or SANTO DOMINGO, the Dominican Republic, occupying the eastern and larger portion of the West Indian Island of Haiti (once known as Hispaniola), the western section forming the Republic of Haiti. It covers an area of 18,045 square miles. The physical features of this division include the Cordillera de Cibao (highest point, Loma Tina, 10,300 feet above the sea), and the Sierra de Monte Christi (highest point, 4,460 feet), the rivers Yagui and Ozama, and lake Enriquillo. The soil is extremely productive and, under settled

government, the Republic could readily be made self-supporting. The mineral wealth consists mainly of gold, copper, iron, coal, asbestos, phosphate, salt and petroleum, but awaits development. The principal crops are sugar, coffee, cocoa, tobacco, rice, cotton and bananas. The forests are rich in such valuable timber as mahogany, logwood, cedar, satinwood, sabina and ironwood. The Republic was constituted in 1844 and was proclaimed on November 14th, 1865 (after a revolution during which the Spanish troops, who had held possession of the country during the two previous years, were expelled). The legislative power is vested in a National Congress of 24 deputies, the executive being vested in a President, elected for four years and assisted by a Ministry of seven members. Each province and district is administered by a governor nominated by the President, and the communes and cantons are controlled by magistrates appointed by the governors, but the communes elect their own councils. Civil war is the curse of the Republic, but with a view to educe order out of chaos the United States has, under treaty, agreed to administer the customs and undertaken to collect the revenue and to assist the Government to maintain peace and to mediate between the Republic and its foreign creditors. San Domingo, the capital, Samana and Santiago de los Caballeros are the chief towns, and Puerto Plata, on the north coast, is the principal port. Pop. (estimated), 416,000.

San Domingo, or SANTO DOMINGO, capital of the Republic of the same name, on the south coast of the island at the mouth of the Ozama. The city is an archbishopric and the chief structures are the cathedral, Government building, the military magazine (formerly a college), the high school and hospitals. It exports sugar and coffee and is a trading rather than a manufacturing centre. The city was founded by Columbus in 1496 and is thus the oldest European community in the New World. The remains of Columbus (d. 1506) were transferred hither from Seville in Spain in 1536 and lay in the cathedral till 1796, when they were removed to Havana Cathedral. After the Spanish-American War they were conveyed (1899) to Spain and placed, in 1902, in a mausoleum in Seville especially prepared for them. Pop. (estimated), 20,000.

Sandown, a watering-place, Isle of Wight, England, 6 miles S. of Ryde. The long stretch of firm sand, the bracing air, and the unconventional character of the place have made the town a favourite holiday resort, especially for children. The modern church of St. John is in the Early English style and is remarkable for its lofty interior. Christ Church, also modern, is in the Early English and Decorated styles. The buildings include the town hall, Odd-fellow's hall and barracks, now used as a military hospital and quarters for the Island militia staff. Pop. (1901), 5,006.

Sandpiper, or SUMMER SNIPE, a popular name for birds of the sub-family Totaninae of the Snipe family (*Scolopacidae*). The bill is straight, or has a slight upward curve, and the toes are joined at the base by a fold of skin. The popular name

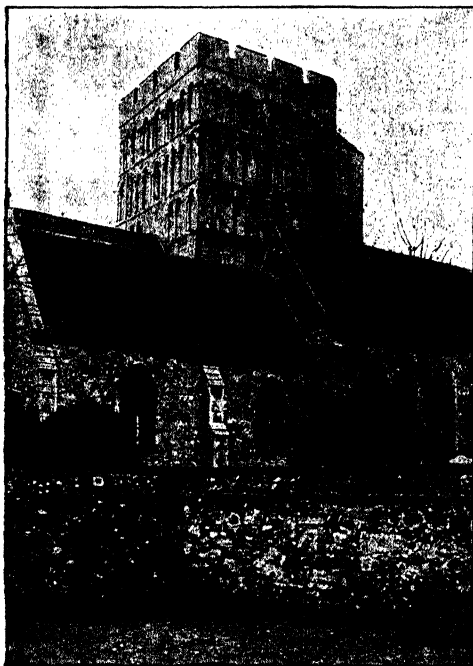
refers to their habit of frequenting wet and sandy places and to their piping note. They feed on small aquatic animals, which they take by probing in the sand with their bills, or catch in rock-pools, or at the water's edge. They are very widely distributed and their migration is generally extensive; the winter is usually spent in South Africa. They frequent the banks of rivers and lakes as well as the seashore, and before migrating become shy and wary, no longer keeping together in companies but found in scattered groups of only two or three. They are all of small size, with prettily marked plumage, and are valued for the table. The Common Sandpiper (*Totanus hypoleucus*), about eight inches long, yellow-brown marked with black above and white below, is a summer visitor to Great Britain and Ireland. The Redshank (*T. calidris*), with a body about the size of a snipe's, with longer legs, is resident in England. The Spotted or Dusky Redshank (*T. fuscus*) is an occasional visitor, as are some other species, amongst them the Little Stint (*T. minuta*), the American Stint (*T. minutella*), and Temminck's Stint (*T. temminckii*). The Phalaropes, which have the toes lobed like those of a coot and webbed at the base, are sometimes called Swimming Sandpipers. They are all inhabitants of the northern regions, though in winter they may be found at times as far south as the Indian Ocean and the Moluccas. The Grey Phalarope (*Phalaropus fulicarius*) and the Red-necked Phalarope (*P. hyperboreus*) are rare visitors to the coasts of the United Kingdom, though the latter breeds in the Orkney and Shetland Islands.

Sandringham, a parish of Norfolk, England, 7½ miles N. by E. of Lynn. It is chiefly noted as containing the country residence of the King. Sandringham House, erected in 1870, is designed in the Elizabethan style and is built of brick with stone dressings. The residential quarters form a parallelogram about 450 feet long by 70 feet deep, and present a pleasant and picturesque elevation. Though the gardens and grounds are not extensive they are laid out tastefully, and are diversified with old trees and small sheets of ornamental water. The entrance gates, fine examples of modern English ironwork, were presented to Edward VII., then Prince of Wales, on the occasion of his marriage (1863). There are ample stabling, waterworks (1878), a dairy (with tea-room for the use of the Queen), and a stud farm. The small but beautiful Perpendicular church of St. Mary Magdalen, standing in the grounds, contains a brass eagle lectern, a thank-offering for the recovery of his Majesty from typhoid fever in 1872. In the churchyard the infant Prince Alexander John Charles Albert was buried in 1871 and the heir-presumptive, the Duke of Clarence, died in the House on January 14th, 1892. Pop. (1901), 98.

Sandstone, sand cemented either by mere pressure producing a welding of the quartz grains, by carbonate of lime, by carbonate or oxide of iron, or by silica. When coarse-grained, it is termed a grit. It is frequently flaggy from the presence of scales of mica. Those in the Old Red Sandstone of Caithness, Dundee, Arbroath, Cork, Kerry, etc.

are among the oldest used in building. The Yorkshire flags, used for paving and for grindstones, and the Craigleith Stone, of which much of Edinburgh is built, belong to the Carboniferous system; the St. Bees Sandstone, used for Furness Abbey, is Permian; whilst some of the variegated or "bunter" sandstones of the Trias are false-bedded, and are only held together by cohesion due to pressure, but others are used in building. In the Hastings Sands highly-ferruginous sandstones, in former times the source of all the English iron, occur; in the Lower Greensand, besides the valuable silicious limestone known as Kentish Rag, beds of rubbly sandstone known as Hassock are worked; and the upper Greensand contains the valuable fire-stone used for furnaces, hearthstones, and building. In the loose sands of Eocene age, known as the Thanet Sands and the Bagshot Sands, the very compact and tough pure sandstone, known as Sarsenstone, of which most megalithic monuments in the south-east of England were made, is found in lines of large irregular nodular masses often left on the surface of the Chalk.

Sandwich, a town and Cinque Port, of Kent, England, on the Stour, 5 miles N.W. of Deal and



SANDWICH: ST. CLEMENT'S CHURCH.

(Photo: Pictorial Agency.)

about 2 miles in a direct line from the North Sea. Once a place of great importance, it now presents an air of decay, but retains much of its old-world picturesqueness. The streets are narrow and

irregular, but parts of the quaint Barbican and the Fishergate are yet extant. The walls have been demolished and now form, planted with grass and shrubs, a pleasant promenade. Some of the churches are extremely interesting. The massive tower of St. Clement's is an unusually handsome specimen of enriched Norman, the other parts of the building being later. St. Peter's, erected in the 13th century on the site of an earlier edifice, is Norman and Early English and contains a fine altar-tomb to Thomas Elys (flourished, 1320-40), founder of the local St. Thomas's Hospital. The buildings include the Free Grammar School, housed in the picturesque Flemish style with stepped gables, founded in 1563 and reorganised in 1894; the Guildhall, dating from 1579; and the charitable foundations of St. Thomas's Hospital and St. John's Hospital. Tanning, wool-sorting, brewing, malting, seed-crushing and iron-founding are carried on, and a considerable export and import trade is done. Between Sandwich and Deal has been laid out the well-known St. George's Golf links, one of the five courses on which the open championship may be played. Created by Edward the Confessor a Cinque Port, Sandwich lost much of its commerce by the silting up of its harbour in the 16th century. It was repeatedly attacked by the Danes, who suffered a severe defeat in 851 at the hands of Athelstan. Canute the Great landed here and in the reign of Henry IV. the town was thrice pillaged and burned by the French. Richborough Castle, $1\frac{1}{2}$ mile to the north-west, is the remnant of the Roman station of Rutupiae and at Ebbs Fleet, about midway between Sandwich and Ramsgate, Hengist and Horsa, the Jute pirates, and Augustine and his colleagues were reputed to have landed. Pop. of Sandwich (1901), 3,170.

Sandwich, EDWARD MONTAGU, 1ST EARL OF, naval commander, son of Sir Sidney Montagu, or Mountagu, born on July 27th, 1625. In November, 1642, he married Jemimah, daughter of John Crew. Owing probably to the influence of his father-in-law he joined the Parliamentary party, raised a regiment of foot and fought at Marston Moor and Naseby. His friendship with Oliver Cromwell led to his being appointed colleague of Admiral Blake in command of the fleet, 1656, and when he brought home the treasure captured outside Cadiz, amounting to £600,000, he was formally thanked by Parliament. After the Protector's death he loyally supported his son, but when Richard Cromwell's nominal authority was gone the new Government treated him with suspicion and he yielded to the influence of Royalist friends. In February, 1659, he was reappointed general of the fleet jointly with Monk, but mutual jealousies delayed the Restoration. On May 8th Charles was proclaimed and Montagu was sent by Parliament to convey the king to England. For his services he was made a Knight of the Garter and created Earl of Sandwich. He was subsequently appointed to bring the young queen, Catherine of Braganza, home, and was high in Court favour until the quarrels of the king and queen caused him to be blamed by both. Sand-

wich greatly distinguished himself while commanding the Blue Squadron during the war with the Dutch, especially in the action off Lowestoft, on June 3rd, 1665. Attacks in Parliament made it impossible for him to retain this command, but he was despatched as ambassador to Spain to mediate peace with Portugal, whose independence he secured by treaty. He returned to England in September, 1668, having concluded a commercial treaty with Spain which Samuel Pepys, who records his daily gossip, said "was acknowledged by the merchants to be the best peace England ever had with them." When war was renewed with the Dutch in 1672 the Earl of Sandwich was reinstated in command of the Blue Squadron and during a gallant fight in Southwold Bay, on May 28th, 1672, his ship, the *Royal James*, was fired by the enemy and blew up. His body was found on June 10th floating on the sea near Harwich and was buried in Henry VII.'s Chapel, Westminster Abbey, on July 3rd, 1672.

Sandwich Islands, a group of islands in the North Pacific, belonging to the United States and officially known as the Territory of Hawaii. They were first sighted in 1542 and rediscovered by Captain Cook in 1778, who named them after the Earl of Sandwich, the first Lord of the Admiralty. They comprise eight inhabited islands and several barren islets, the former being Hawaii (4,210 square miles), Maui (760), Oahu (600), Kauai (590), Molokai, the isle of lepers (261), Lanai (135), Nihau (97) and Kahoolawe (69). Their total area is estimated at 6,500 square miles (including the water area). They are of volcanic origin and in some are the largest extinct and active volcanoes in the world. Mauna Kea (13,805 feet) and Mauna Loa (13,675 feet) are situated in Hawaii, Kilauea (4,400 feet), rising from the eastern flanks of Mauna Loa, being one of the most active craters in the globe. On Maui is the crater of Haleakala, about 30 miles in circumference, from 2,000 to 3,000 feet deep and 10,030 feet above the sea. The flora includes the pandanus, acacia, palm, fern, banana, plantain, mango, guava, Malay apple, coffee, colocasia (taro), strawberry and raspberry, the introduced fruits thriving almost as well as the indigenous. Bats and rats are the largest fauna. The minerals comprise sulphur, pyrites, salt, sal ammoniac, and hematite. Sugar and rice are the staple industries, but the exports also include coffee, bananas, pineapples, wool, and hides. Honolulu (39,305), in Oahu, is the capital. The natives are Polynesians of high standard and profess Christianity. In former times each isle had its own king, but under Kamehameha I. (d. 1819) the group was formed into one kingdom under a mild despotism, which endured till 1840 when Kamehameha III. established constitutional rule. In 1893 the reigning sovereign Queen Liliuokalani was deposed and a republic was proclaimed in the following year. But in 1898 the islands were annexed by the United States and, in 1900, constituted a Territory. There are a Senate and a House of Representatives, with a Governor and Secretary, each appointed for four years by the President of the United States.

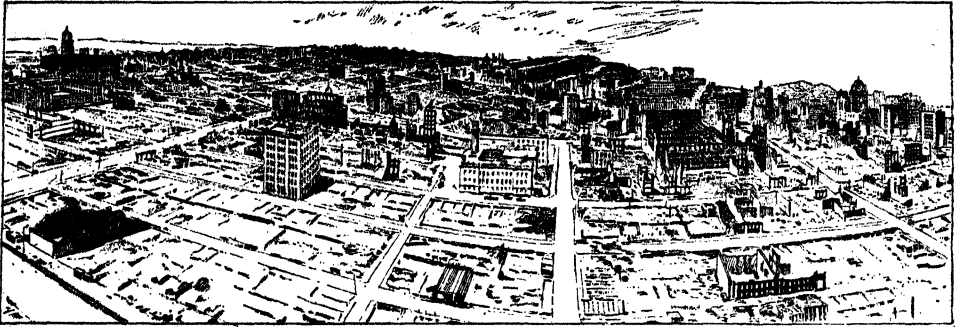
Pop. (1900), 154,001 (Oahu, 58,504; Hawaii, 46,848; Kauai and Nihau, 20,734; Maui, 25,416; Molokai and Lanai, 2,504). The natives have diminished from 400,000 in Captain Cook's time (1778) to 29,834 in 1900, their probable fate being thus only too obvious.

San Fernando, a town of the Isle of Leon, in the south-west of Spain, 7 miles S.E. of Cadiz. The public buildings include the town hall, consistorial palace, hospital, and bull-ring. It has several schools, at one of which, in the suburb of San Carlos, boys are prepared for the navy. At the port of Carraca, 1 mile to the north on Cadiz Bay, is an arsenal, and the observatory is the most southerly in Europe. The vicinity has numerous gardens, vineyards, and stone quarries. The manufactures comprise sails, cordage, barrels, salt, flour, spirits, beer, besides tanneries and iron-foundries. Pop. (estimated), 30,000.

San Francisco, colloquially known as **FRISCO**, the chief city and port of California, United States, and the largest city on the Pacific coast, occupying the southern horn of the Bay of Francisco and having an area of 47 square miles. It has a noble situation and covers an undulating surface, several of the hills being built over. Its growth has been remarkable. In 1776 only a Spanish mission for converting Indians possessed the site. In 1836 a small village called Yerba Buena sprang up on the Bay, which took the name of San Francisco in 1847. In the following year gold was discovered and immediately there ensued a rush of diggers from all parts of the globe, and in 1850 the place was incorporated as a city. In 1860 the population was 56,802 and in 1900 it had risen to 342,782. Its climate is mild, though trying at seasons by reason of its extraordinary variations of temperature within the 24 hours, but its death-rate (21.3 per 1,000 in 1903) is amongst the highest in the Union and may have some bearing on its climatic vagaries as well as its ominous *sobriquet* of the Suicide City. The industries comprise shipbuilding, sugar-refining, iron-founding, meat-slaughtering and -packing, fruit-canning, brewing, tanning and the making of chemicals. The traffic at the port is heavy and there is steamship communication with Central and South America, Japan, China, the principal of the Pacific Islands and Australasia. The city is almost as cosmopolitan as Paris, and the Chinese quarter is as interesting as it is notorious. The public spaces comprise several beautifully laid-out cemeteries and the magnificent Golden Gate Park, covering an area of 1,050 acres, extending from the city to the Pacific shore, and commanding superb views of the Golden Gate—the mile-wide and five-miles long waterway that gives admittance to the Bay—and the Seal Rocks. By an appalling calamity—not, alas! unparalleled—many of its most famous public buildings were destroyed in 1906. At 5 in the morning of April 18th, the city was severely shaken by earthquake, which not only damaged many structures, but also—what proved in the event to be greatly worse—dislocated thousands of gas-pipes. The escaping gas ignited and set up a huge conflagration which was not subdued until the 20th,



PANORAMIC VIEW OF SAN FRANCISCO, TAKEN ON THE MORNING OF APRIL 18TH, 1906, FROM NOB HILL, A SHORT TIME AFTER THE FIRE STARTED, SHOWING COMPARATIVELY INSIGNIFICANT DAMAGE DONE BY THE EARTHQUAKE.



PANORAMIC VIEW OF SAN FRANCISCO, TAKEN APRIL 22ND, 1906, FROM AN AEROPLANE, SHOWING THE DAMAGE BY FIRE AND HOW SUBSTANTIAL STRUCTURES WITHSTOOD BOTH EARTHQUAKE AND FIRE.

by which time it had wiped out the major portion of the business quarter and a considerable portion of the residential districts. Unfortunately the water-supply went out of gear and the efforts of the fire brigade were immensely hampered. As to the damage conservative estimates placed the loss of life at 5,000 and the loss of property at £100,000,000, while 200,000 persons were rendered homeless. By the combined energies of railways and shipping companies and the action of the local authorities, the wants of the starving people were speedily relieved. Within nine days of the outbreak the Southern Pacific Railway had transported about 300,000 people, and by the night of May 3rd no fewer than 1,409 trucks of all sorts of provisions and other goods suitable to the necessities of the time had been brought in by the same company. It was demonstrated that the vast loss and damage were caused by the fire and not by the shock, and it was also held as proved that steel-built edifices withstood such catastrophes better than stone-built. With wonted spirit the citizens did not take the disaster lying down, but at once set about the construction of a new city which should rise from the ashes of the old more glorious and more beautiful.

Sanhedrim (from a Greek word for *Council*), the supreme court of the Jews in matters both civil and ecclesiastical, though in its inception it was neither more nor less than the municipal council of Jerusalem. It existed in the time of the Maccabees and in the days of the New Testament. It was modelled on the Mosaic Council, and consisted of a President and 70 members, chosen from among the chief priests, elders, and scribes. This, the Great Sanhedrim, had the appointment of Lesser or Provincial Sanhedrims, consisting of 23 members each, whose duty it was to administer and regulate the local affairs of villages and small towns. In the days of Roman ascendancy the Sanhedrim could not inflict sentence of death without the consent of the Governor. The seat of meeting was afterwards removed to Tiberias. In 1806 Napoleon I. summoned a Sanhedrim to regulate the affairs of the Jews.

Sanitation, the science of health, and the art of maintaining the public health and keeping off disease. The principles of sanitation, which are in many civilised communities enforced by legal enactments, have reference generally to dwellings,

food and drink, clothing, and cleanliness. With regard to dwellings, sanitation insists upon good drainage, sufficient ventilation, and the allowance of a due proportion of air to each inhabitant, the avoidance of overcrowding, especially in sleeping apartments, the maintenance of a proper degree of warmth and the provision of plenty of open spaces and parks. As to food, it forbids the eating of decaying or improperly-cooked matter, prescribes the avoidance of eating unripe or over-ripe fruit, insists on adulteration being confined within definite limits (though often paying, through its officials, more attention to the milkman than the publican), exacts and properly exacts the daily inspection of all food offered for sale and of all materials intended to be utilised for food (as the pork for sausages and the fruit for jams). Socially it subjects all workshops and factories to repeated visits, to see that young operatives are not worked illegally and that other statutory and local requirements are complied with, establishes baths and wash-houses, and so forth. With regard to clothing, it recommends the use of woollen materials, and such as best keep up a uniform degree of animal heat; with regard to cleanliness, it advocates a plentiful use of soap and water and other similar purifiers and disinfectants both for personal and domestic purposes. One great means of lessening disease is the isolation of patients suffering from infectious complaints. It is not always easy to reconcile the claims of the public welfare with the rights of individual freedom. Vaccination has always been a cause of heart-burning and discontent, and compulsory registration and treatment of disease are by no means universally accepted, though the prompt notification of infectious diseases is obviously in the interests of the whole community. In the United Kingdom most matters connected with public health come under the jurisdiction of the Local Government Board and the Home Office, or of the town and county councils.

San José, capital of Santa Clara county, California, United States, on the Guadalupe, 48 miles S.E. of San Francisco. Its climate is singularly delightful and exhilarating and it lies amidst beautiful gardens and a semi-tropical vegetation. Its chief industry is concerned with the growing and packing of fruit. The earthquake of April 18th, 1906, inflicted serious damage to property. Pop. (1900), 21,500.

San José, or **SAN JOSÉ DEL INTERIOR**, the capital of Costa Rica, Central America, 12 miles W.N.W. of Cartago. It is situated in a fertile valley at an elevation of 3,868 feet above the sea, and being in railway communication with Limón on the Atlantic and the Pacific is the commercial centre. The prominent buildings comprise the cathedral, museum, public library, national theatre, and several learned, scientific and charitable institutions. Pop. (estimated), 25,000.

San Juan, formerly **SAN JUAN BAUTISTA DE PUERTO RICO**, capital of Porto Rico, on a small island off the north coast connected with the mainland by means of bridges and a causeway. It was

founded in 1577 by Juan Ponce de Leon, the first Governor, of whom it contains a statue. It is strongly fortified by the Morro at the entrance of harbour, the commanding citadel of St. Cristobal and the forts Santa Elena and San German. The public buildings include the cathedral, the Government offices, the episcopal and Captain General's palaces, the city hall, the Casa Blanca (said to have been erected by Ponce de Leon), and the military hospital. After the Spanish-American War (1898), during which (July) the fortifications were bombarded by Admiral Sampson, the island was occupied by the United States. Owing to the scarcity of building sites, the houses are two or three storeys in height—an undesirable feature in the earthquake zone. The United States has raised San Juan to a naval station. The manufactures are unimportant. Pop. (1899), 32,048.

Sankara, a Brahminical saint and teacher, who flourished at a period referred by some authorities (probably rightly) to the 9th century after Christ and by others to about 200 B.C., was apparently a native of Western India and a member of the Namburi caste. He led a roving life, visiting Cashmere, it is said, and dying very early at Kedarnath in the Himalaya. Many commentaries on the Sutras, Bhagavadgita, and Upanishads are ascribed to him.

San Luis Potosi, a state of Mexico, bounded on the N. and N.E. by Nuevo Leon and Tamaulipas, on the S.E. by Vera Cruz, on the S. by Hidalgo, Queretaro and Guanajuato and on the W. by Zacatecas. It covers an area of 25,316 square miles. Most of the state occupies part of the central plateau. The soil of the valleys is rich, while the uplands afford excellent pasturage for the large herds of cattle. Though the mineral wealth is great the bulk of it has yet to be developed, but metallurgical works have been established in the capital, San Luis Potosi. Pop. (1900), 575,432.

San Luis Potosi, capital of the preceding state, Mexico, 220 miles N.W. of Mexico City. It is a well-built town, Spanish in aspect, with constant suggestions of the Oriental. The principal buildings are the cathedral, Government House, the city hall, the palace of justice, and the mint. The Instituto Científico does duty as a university. It has smelting-works, cotton factories and railway workshops, while silver mines occur in the vicinity. In 1863 it became the headquarters of the national administration under Juárez, who recovered it four years later from Marshal Bazaine. Pop. (1900), 61,019.

San Marino, the smallest independent republic in Europe, situated between the Italian provinces of Forlì and Pesaro-Urbino, occupying an area of 33 square miles, and forming part of an eastern spur of the Apennines, of which Monte Titano reaches a height of 2,650 feet. Agriculture, the raising of live-stock and wine-making are the leading industries. The state is governed by a Grand Council of 60 life-members, which elects from its number a committee of twelve which, with the assistance of a legal adviser, superintends particular departments

and constitutes the supreme court. Executive power is entrusted to two captains-regent, elected every six months, one by the nobles, the other by the burgesses and farmers. The republic is named after Marinus, a mason from dalmatia, who settled here in the 3rd century. It was fortunate to maintain its integrity throughout the internecine strife that went on in Italy in the Middle Ages, having secured the protection of the house of Urbino. When Urbino was annexed to the States of the Church in 1631, the independence of San Marino was recognised. Napoleon I. regarded it as a "model republic" and preserved it (1797), as also did Napoleon III. when (1854) Pio Nono was supposed to have designs on it. Now the King of Italy is looked upon as its special friend and natural protector. The chief town, San Marino (1,700), perched upon a rock, has narrow streets and picturesque houses, the chief buildings being the council hall, law court, museum and library. Pop. (estimated), 11,500.

Sanguhar, a town of Dumfriesshire, Scotland, on the left bank of the Nith, 12 miles N.W. of Thornhill. It became a burgh of barony in 1484 and was made a royal burgh in 1596. Its place in history is due to the fact that, in 1680, Richard Cameron, the Covenanter, issued here a declaration in which he proclaimed war against the king, repudiated prelacy and monarchy, and avowed his intention of setting up some other form of government—a document usually styled the Sanguhar Declaration. The castle, on an eminence overlooking the Nith, is now in ruins, but was formerly an important fortress with towers at the angles and surrounded by a ditch. The chief buildings are the town hall and public hall. There are manufactures of spades and shovels, and bricks and tiles, but coal-mining is the principal industry, the coalfield being seven miles long and two and a half miles in breadth. The Admirable Crichton was born at Ellock, in the neighbourhood, on August 19th, 1560. Pop. (1901), 2,933

San Remo, a seaside resort in the province of Porto Maurizio, Italy, beautifully situated on the Mediterranean, 70 miles S.W. of Genoa and 26 miles N.E. of Nice. Owing to its sheltered position it is a favourite winter retreat with those who suffer from chest complaints, the stay of the German Emperor Frederick III. in 1887-8 having lent it increased vogue. Roses, carnations and other flowers are exported, while oranges, lemons, palms and semi-tropical trees grow in profusion and enhance the attractiveness of the place. It is divided into an old town, exceedingly picturesque with its narrow, steep streets and lofty houses, and a new town handsomely laid out in boulevards, drives and gardens. The chief buildings include the cathedral of San Siro, the town hall, and the Charles Albert Hospital. San Remo is supposed to be a corruption of San Romolo (Romulus), a bishop of the 6th century, whose day, October 13th, is still observed as a public festival. Pop. (1901), 21,440.

San Salvador, capital of the republic of Salvador, Central America, on a small river that flows

into the Pacific, from which the town is some 20 miles distant. Founded in 1528 at a short distance from its present site, it was moved hither eleven years later. It became the capital in 1834, and is the seat of a bishop. The chief buildings include the national palace (Casa Blanca), the cathedral, university, library, museum, observatory, polytechnic, hospital and other charitable and educational institutions. The city having suffered a great deal from earthquakes in the third quarter of the 19th century a style of edifice has been adopted that will minimise the damage to life and property caused by these shocks. San Salvador is an important trading centre and has minor manufactures. Pop. (1901), 59,540.

Sans Culottes (literally, "without breeches"), the name conferred in derision in 1789 on the tag-rag and bobtail portion of the French revolutionists, and, like the similar contemptuous epithet *Les Gueux* ("The Beggars"), applied to the revolted inhabitants of the Netherlands at an earlier period, afterwards adopted as a title of honour by those to whom it had been given. But though it grew synonymous with a good patriot and Republican citizen, as the revolutionary ardour cooled and the derivative meaning of the word (= residuum) again came in sight, its use gradually died out, and had been abandoned by 1804 when Napoleon became Emperor.

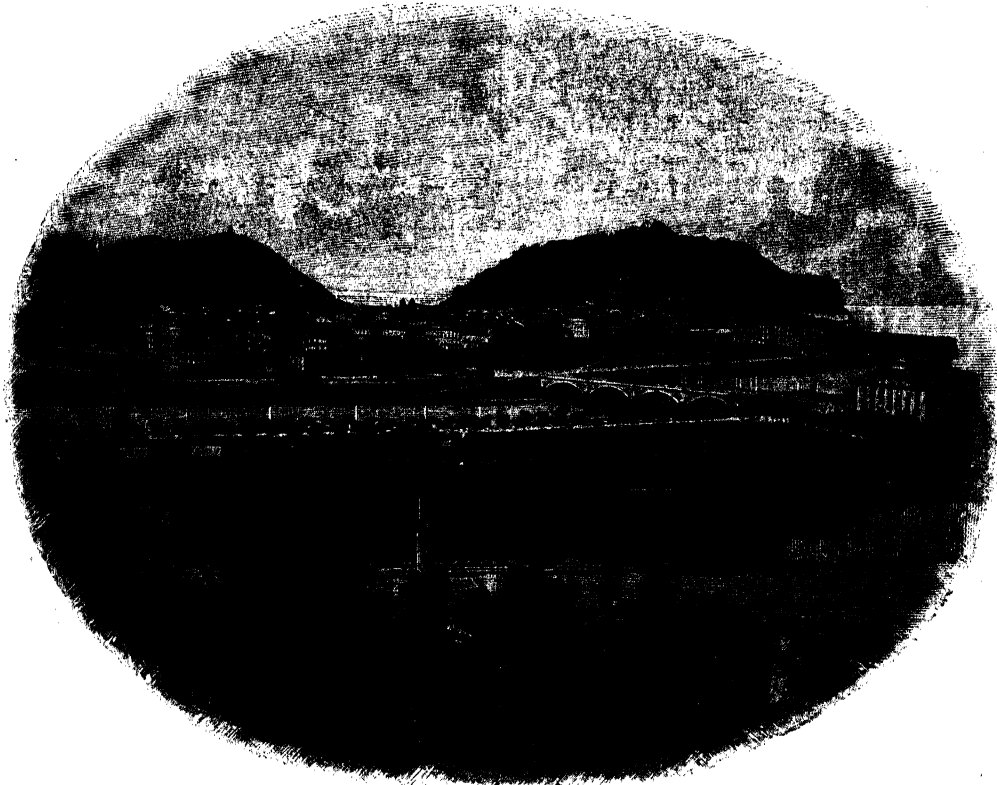
San Sebastian, capital of the Basque province of Guipuzcoa, Spain. It is the summer residence of the Court and one of the most attractive watering-places in Europe. It is finely situated on an isthmus which terminates in the rock of Monte Urgull, one side being flanked by the little river Urumea and the other by the bay of La Concha, which forms the harbour. Though the fortifications have given way to boulevards, the castle of La Mota on the summit of Urgull still dominates the town. The principal buildings are the queen's summer palace of Miramar, the bull-ring (which seats 10,000 spectators), the *Palacio de la Diputacion*, the casino, the town hall, the Renaissance church of Santa Maria, and several educational institutions. The fisheries are of considerable importance, and the industries include brewing, paper-making, and saw and flour mills, besides manufactures of preserves, soap, candles and glass. The most memorable of the several sieges which the town has sustained was that in August, 1813, when it was stormed by the British under Wellington. Pop. (1900), 37,812.

Sanskrit, the mother tongue of the Indic branch of the Aryan family, and, on the whole, the best preserved, though not in every respect the most primitive, of all Aryan languages, its nearest congeners being Old Persian, Hellenic, and Lithuanian. It is the sacred and oldest literary language of the Hindus, who regard it as of divine origin, and therefore perfect, whence its name *sanskṛita* ("made perfect"). It has been divided into three distinct periods:

(1) Vedic (Khandas), the language of the hymns (1500 B.C.?), of the Brahmanas (800?), and Sutras (500); (2) literary language (Bhasha), as in Panini's grammar (300 B.C.?), the Inscriptions of Kanishka and Rudradaman (1st and 2nd centuries after Christ), and the Renaissance literature (A.D. 400); (3) vulgar language (Prakrita): Gatha, Pali, Magadhi, Maharashtri (A.D. 50-500), merging gradually in the Neo-Sanskritic, for which see GAURIAN.

northern shore of the Sea of Marmora. It is noted as the place where the preliminary treaty of peace between Russia and Turkey was signed on March 3rd, 1878.

Santa Ana, a western department of the republic of Salvador, Central America, adjoining Guatemala. It is mountainous and the Lempa is the chief river, while Lake Guijar lies on the Guatemalan boundary. Agri-



SAN SEBASTIAN.

[For script see DEVANAGARI.] Owing to its religious and literary importance, Sanskrit has never ceased to be cultivated by the Hindus, and has been extensively studied in Europe for its philological interest since the time of Sir William Jones (1746-94), who first drew attention to its intimate relations with the classical languages of the West. Thus were laid the foundations of comparative philology, which as a science may be said to date from the "discovery" of Sanskrit.

Sans Souci. [POTSDAM.]

San Stefano, a village, 6 miles W. by S. of Constantinople, Turkey-in-Europe, on the

culture is the leading industry and coffee the principal product. The capital is Santa Ana (48,120). Pop. (estimated), 85,000.

Santa Anna, ANTONIO LOPEZ DE, President of Mexico, was born at Jalapa, Mexico, on February 21st, 1795, and, having entered the army, espoused the cause of Iturbide, whom he assisted in the capture of Vera Cruz (1821), but subsequently overthrew on account of his imperial pretensions. He proclaimed a republic (1822), and took an active part in military operations against the Spaniards. Elected president in 1833, he was defeated and imprisoned three years later by the Texan party.

He regained his position in 1846, but was forced to resign next year by the American generals Winfield Scott and Zachary Taylor, though he once more held office from 1853 to 1855. He resisted Maximilian, and was afterwards banished by Juarez, but returned on the death of his opponent, and died in Mexico on June 20th, 1876. He was a born intriguer, but, like the Bourbons, would learn nothing, and so missed more chances than usually fell to the same man in the once sultry politics of his native country.

Santa Catharina, a maritime state of Brazil, bounded on the N. by Parana, on the E. by the Atlantic, on the S. by Rio Grande do Sul, and on the W. by the Argentine province of Misiones. It occupies an area of 28,620 square miles. Saving the low-lying coastal land, the surface is mountainous and well-watered. The hills are well clad with forests, and in the extreme west are grassy plains affording good pasturage. Agriculture is the chief industry, the principal products being sugar, tobacco, manioc and maize. The mineral wealth includes gold, silver, iron, petroleum and coal, but only the last-named is mined to any considerable extent. The seaport of Desterro or Florianopolis (30,687) is the capital. Pop. (estimated), 290,000.

Santa Claus. [NICOLAS.]

Santa Cruz, or ST. CROIX, an island of the Lesser Antilles, forming with St. John and St. Thomas in the Virgin Islands, the Danish West Indies. It lies 65 miles to the south-east of Porto Rico and has an area of 83 square miles. It is fertile and well-watered. The predominant industry is sugar, but some cattle are raised, and rum is distilled. The capital is Christianstad. The island was purchased by the Danes in 1733, occupied by Great Britain in 1807, and restored to Denmark in 1814. Pop. (1901), 18,600.

Santa Cruz, the most easterly department of Bolivia, South America, adjoining Brazil. It covers an area of 141,330 square miles. Excepting in the west, where it is broken by Andean spurs, the surface is mostly occupied by pampas, well watered by the Mamoré and its numerous tributaries. The chief crops are sugar, coffee, cacao, rice, cotton, and indigo, and large quantities of rubber and drugs are exported. Honey is a considerable product. The capital is Santa Cruz de Sierra (18,335) on the Rio Grande. Pop. (1900), 209,592.

Santa Cruz de la Palma, the capital of Palma, one of the Canary Islands, belonging to Spain. It is situated on a capacious bay on the east coast and shipbuilding is carried on on a considerable scale. The principal exports include wine, fruit and cochineal. Pop. (1900), 7,383.

Santa Cruz de Tenerife, the capital of the Canary Islands, on the north-east coast of Tenerife. The chief buildings include the

Captain-General's palace, Government house, the museum and several educational institutions. There is an excellent harbour and the exports comprise wine, brandy, sugar, dairy produce, cattle, cochineal and bananas. Pop. (1900), 38,419.

Santa Fé, a province of the Argentine Republic, South America, bounded on the N. by Chaco, on the E. by Corrientes and Entre Rios (from both of which it is separated by the Parana), on the S. by Buenos Aires and Cordoba, and on the W. by Santiago del Estero. It covers an area of 50,916 square miles. The surface is watered by the Salado and well suited for agriculture and live-stock. A portion of the area has been acquired by the Jewish Colonisation Association. The chief towns are Rosario (131,000) and Santa Fé, the capital (33,200), which is the seat of a provincial university and has some shipbuilding. Pop. (estimated), 640,755.

Santa Fé (Spanish, "Holy Faith"), the capital of the Territory of New Mexico, United States, situated some 20 miles E. of the Rio Grande, in about 36° N. and 106° W. Next to St. Augustine in Florida it is the oldest town in the Union, having been settled by Spanish colonists in the beginning of the 17th century. It still preserves much of its old-fashioned aspect. Amongst the principal buildings are the Governor's palace, the cathedral of San Francisco, the church of San Miguel, Fort Marcy—these belonging to remoter times—the capitol, museum, federal building, San Miguel College and Loretto Academy—these being modern. Stock-raising and mining are the leading occupations. Pop. (1900), 5,603.

Santander, a Biscayan province of Spain, situated in Old Castile, and occupying an area of 2,108 square miles. It is traversed from east to west by the Cantabrian Mountains. The principal crops are rye, barley, oats, and maize, and the uplands carry sheep, cattle, goats, pigs, and horses. The mineral wealth includes zinc, iron, lead, lignite, and salt. Fisheries form the leading industry, but there are manufactures of glass and beer, and considerable exports of salted and tinned fish. Pop. (1900), 276,033. —

Santander, capital of the preceding province, on the Bay of Biscay, Spain, 210 miles N. of Madrid. It is finely situated on the inner side of a rocky peninsula, has a capacious harbour, and is a favourite summer resort. The principal buildings are the cathedral and the castle of San Felice, containing the prison. The manufactures include chemicals, sail-cloth, and tobacco, and the sea-borne traffic is of growing importance. Here Charles V. landed when he came to assume the Spanish crown. Pop. (1900), 54,694.

Santarem, a district of the province of Estremadura, Portugal, occupying an area of 2,555 square miles. It is watered by the Tagus, and the river valley is extremely fertile. Pop. (1900), 283,154.

Santarem, the capital of the preceding district, on the right bank of the Tagus, Portugal, about 45 miles N. by E. of Lisbon. It was named after St. Irene. It is an ancient town (dating back to Roman times) and is of considerable historical interest, although there are few remains of the remote past. It was a Royal residence in the Middle Ages, and the burial place of Pedro Alvares Cabral, the discoverer of Brazil (1500). Some attempt has even been made to claim Camoens as a native. It is famous for its wine, oil, fruits, and vegetables. There is a fine bridge across the Tagus. Pop. (1900), 8,704.

Santerre, ANTOINE JOSEPH, revolutionary, was born in Paris on March 16th, 1752, and made a fortune as a brewer. In 1789 he had command of a battalion in the National Guard, assisting in the capture of the Bastille. Joining the Jacobins, he played a prominent part in the events of 1791 and 1792, and was promoted to the rank of general of division. His utter failure in the War of La Vendée led to his recall and imprisonment. The *coup d'état* of the 9th Thermidor (July 27th, 1794) saved his life, but Napoleon declined to give him employment, though he restored him to his nominal rank. He died at Paris on February 6th, 1809.

Santiago, the capital of Chile, South America, on the Mapocho, in a plain at the foot of the Andes, 65 miles S.E. of Valparaiso. Laid out with great regularity, the houses being mostly after Spanish design, the city is one of the most imposing in South America. It is an archbishopric, and among the principal buildings are the cathedral (destroyed by earthquake in 1647 and rebuilt in 1748), the Dominican church with fine columns of marble monoliths, the old Presidential palace (Las Cajas), the palais of justice, mint, Congress Hall, the university (founded in 1842), the museum, observatory, National Library, several hospitals, a splendid opera house, the National Institute, the Pædagogic Institute, the Conservatory of Music, and other well-equipped educational establishments. The city contains several magnificent public squares, avenues, and botanical and zoological gardens, some of which are adorned by decorative fountains and statues of Chilean celebrities. The river has been embanked by the Tajamar, a mass of masonry to hold the Mapocho in check. The view of the Andes offers one of the noblest prospects of mountain scenery in the world. The manufactures are unimportant. Santiago was founded in February, 1541, by Pedro de Valdivia, one of Pizarro's captains. One of the most harrowing incidents in its annals was the burning of the Jesuit Church, on December 8th, 1863, when more than 2,000 persons perished. It was visited by the most terrible earthquake in its history on August 16th, 1906, when many buildings, including some of those mentioned, sustained irreparable damage, while others were wrecked. Pop. (1903), 334,538.

Santiago de Compostella, a town of the province of Corunna, Galicia, Spain, 33 miles S. by W. of Corunna. It is the seat of a university, created in 1504 by bull of Pope Julius II., and of an archbishop, and claims the primacy of Spain. The cathedral, a fine example of Early Romanesque, was founded in 1078 on the site of the earlier chapels which were erected to receive the body of James the Great. By tradition the saint's bones were discovered in 835 by Theodomir, Bishop of Iria, who was guided to this spot by a star—whence the town received its name (*Campus stellæ*), Santiago meaning "Saint James." The possession of these relics drew vast pilgrimages from all quarters during several centuries, but the number of pilgrims has long ceased to be in any degree remarkable. The most superb part of the cathedral is the 12th-century portico de la Gloria of the west front. The Royal Hospital was built in 1504 by Ferdinand and Isabella, and consists of four court-yards (two in the Gothic and two in the Classic style) with a chapel. It has a good gateway and an elegant fountain. The industries—which comprise brewing, distilling, and the making of paper, matches, soap, and chocolate—are not of much account, the prosperity of the town having mainly depended on the custom of the pilgrims. Pop., 24,900.

Santiago de Cuba, the most easterly of the provinces of Cuba, bounded on the west by Puerto Principe. It covers an area of 12,468 square miles. The Sierra Maestra occupies the south-eastern extremity, attaining in Pico de Turquino (which is also the loftiest summit in the island) a height of 8,328 feet, and the Cauto and Solado are the chief streams. The principal crops are cereals, sugar, tobacco, coffee, and cacao, while the mineral wealth comprises copper, manganese, iron, mercury, marble, and petroleum. Live-stock are reared and honey and wax are also produced. The capital is Santiago de Cuba. Pop. (1900), 327,716.

Santiago de Cuba, the capital of the preceding province, Cuba, situated on an excellent harbour on the south-eastern coast, 475 miles S.E. of Havana. It was founded in 1514 by Diego Velazquez, and, until superseded by Havana in 1551, was the capital of the island. During the Spanish-American War Cervera's fleet was destroyed on July 3rd, 1898. Since the American occupation considerable improvements have been effected in its sanitation and in other respects. The principal buildings are the cathedral, Government palace, and several charitable and educational institutions, and the chambers of commerce, industry, and agriculture. The immediate neighbourhood is rich in minerals, and the industries comprise iron-foundries, machine-shops, and tobacco factories, while there is a heavy export of the island produce. Pop. (1900), 45,478.

Santley, CHARLES, singer, was born in Liverpool on February 28th, 1834. His father, a

journeyman bookbinder, subsequently collector of rates, being devoted to music, was able by strict economy to afford his son lessons. He taught his children their notes, and when he became organist of Myrtle Street Baptist Chapel his son made his first appearance as an alto. In his reminiscences, *Student and Singer*, Charles Santley ascribed his first awakening to the charm and power of music to hearing Haydn's *First Mass* performed. Having determined to adopt a musical career, he studied both in England and in Italy, where he began by singing small parts in opera. Befriended by H. F. Chorley, and advised by him to return home, he made his *début* in the part of "Adam" in *The Creation*, at St. Martin's Hall, London, on November 16th, 1857, but it was not until he sang the title rôle in *Elijah*, at Exeter Hall, in March, 1858, that his great gifts were recognised. On April 9th, 1859, he married Gertrude Kemble, grand-daughter of Charles Kemble, and in the same year made his first conspicuous success at Covent Garden, as "Hoel" in the opera of *Dinorah*. For several years he sang on the English and Italian operatic stage. His last appearance in opera was at the Lyceum, in 1876, as "Venderdecken," in *The Flying Dutchman*, which part he sang when this, the earliest of Wagner's operas to be given in England, was first performed. Santley has sung at all the important musical festivals. In 1889 he visited Australia, and in 1893 the Cape of Good Hope. The fine quality and compass of his voice, his fervour and dramatic expression in oratorio, and his artistic method, have maintained the highest traditions of his art. In 1907 a testimonial concert was held in his honour in the Royal Albert Hall, in London.

Santo Domingo. [SAN DOMINGO.]

Santonin. This drug— $C_{15}H_{15}O_5$, the active principle of *santonica*, or wormseed—is employed as an anthelmintic with a view to destroying the common round worm, and sometimes the threadworm. It is apt to produce disturbances of vision and should only be administered under medical advice. The dose is 1 to 3 grains for a child.

Santorin, the ancient *Thera*, an island of the Greek Archipelago, one of the most southerly of the Cyclades, about 60 miles nearly due north of Candia or Crete. It is a crescent-shaped mass, 35 square miles in area, of volcanic origin, and has several times been active, there having been an eruption as recently as 1866. Hagios Ilias (Mount St. Elias) is the highest point (1,916 feet above the sea). Wine is the leading product, but volcanic cement, lava, and pumice are also exported. Santorin and Therasia, an adjoining isle, have yielded, as the result of excavations, several interesting remains, especially of the dwellings of prehistoric man. Pop. (estimated), 15,000.

São Francisco, a river of Brazil, South America, rising in the mountainous country in the extreme south of the state of Minas Geraes.

Pursuing at first a northerly direction, it begins to bend towards the north-east about $15^{\circ} 30'$ S., till it reaches Cabrobo in $8^{\circ} 30'$ S., where, turning to the south-east, it falls into the Atlantic by two mouths, midway between Salvador (Bahia) and Pernambuco (Recife), after a course of 1,200 miles. The falls of Paulo Affonso, a series of grand cataracts making a drop of 270 feet, 180 miles from the ocean, impede navigation; but from this point upwards to the confluence of the Rio das Velhas, a distance of 900 miles, navigation is practicable, to take advantage of which a railway has been constructed to beyond the Paulo Affonso Falls, and then the waterway is resorted to. The left-hand affluents include the Abaete, Paracatu, Carinhonha, and Grande; the right-hand the Rio das Velhas, Verde Grande, Santo Onofre, and Jacare.

Saône, a river of France, rising in the Faucilles hills of the Vosges mountains, flows in a south-westerly direction till it enters the Rhône at Lyons. Its affluents are, on the right, the Amance, Solon, Vingeanne, and Dheune and, on the left, the Coney, Lanterne, Durgeon, Ognon, and Doubs. The chief towns on its banks are Gray, Auxonne, Châlon, Tournus, and Macon. It has a total course of 300 miles, and, by means of canals, communicates with the Rhine, Loire, and Yonne.

Saône, HAUTE-, a department of France, bounded on the N. by the department of Vosges, on the E. by the territory of Belfort, on the S. by Doubs and Jura, and on the W. by Côte d'Or and Haute-Marne. It covers an area of 2,074 square miles. It has a general trend from the mountainous east and north-east, the highest point being the Ballon de Servance. The limestone plateau of which it largely consists is pierced by cañons and underground caverns. The chief rivers are the Saône and its tributaries the Amance and Salon, on the right, and the Coney, Lanterne, Durgeon, and Ognon, on the left. Agriculture is the leading industry, the principal crops being wheat, oats, potatoes, vines (yielding a wine of moderate quality), rye, barley, maize, millet, beetroot, and pulse. The prevailing trees are fir, beech, oak, wych elm, and aspen. Live-stock are raised in considerable numbers, and bees and dogs are kept on a somewhat extensive scale. The mineral wealth comprises iron, coal, copper, silver, manganese, gold, salt, and a rich variety of building-stone, the green porphyry of Napoleon's tomb in the Invalides and the syenite of the Grand Opera House in Paris having been cut at Servance. There are saline and chalybeate springs at Luxeuil. Among the industries are iron-founding, copper-founding, engineering works, cotton and other textile mills, dyeing, and tanning, while the manufactures comprise glass, pottery, earthenware, bricks and tiles, agricultural implements, machinery, ironware, tools, paper, hosiery, sugar, flour, starch, oil, and chemicals, and kirschwasser is made at Fougères from the native cherries.

Vesoul is the capital. The department was formed in 1790 out of the northern part of Franche Comté. Pop. (1901), 266,605.

Saône-et-Loire, a department of France, bounded on the N. by Côte d'Or, on the E. by Jura, on the S.E. by Ain, on the S. by Rhône and Loire, and on the W. by Allier and Nièvre. It occupies an area of 3,330 square miles. The mountain system, to which, in this department, the Charolais belongs, constitutes the watershed between the Mediterranean and the Atlantic. Its highest point (2,960 feet) is in the Morvan hills, near the Nièvre boundary. The chief rivers are the Saône (bounding the department on the south-east), with its affluents the Dheune, on the right, and the Doubs and Seille, on the left, and the Loire (the western boundary), with its right-hand tributary the Arroux. As this is one of the largest departments in France, its agricultural interests are considerable. The raising of live-stock is an important pursuit, and the white oxen of the Charolais are among the finest of French breeds. The leading crops are wheat, rye, barley, maize, millet, oats, potatoes, pulse, beetroot, and colza. The vineyards yield an esteemed grape, the red wines of Macon and the white of Pouilly being in general repute. The minerals include coal, iron, manganese, kaolin, and precious stones, while granite and other varieties of building-stone are quarried. The coal-field of Creuzot is extremely rich. The manufactures comprise locomotives, machinery, textiles, pottery, glass, flour, and sugar, in addition to iron-founding, copper-founding, distilleries, tanneries, oil-refineries, and oil-works. The capital is Macon (18,928). Pop. (1901), 620,360.

São Paulo, a state of Brazil, South America, bounded on the N. and N.E. by Minas Geraes and Rio de Janeiro, on the E. by the Atlantic, on the S. by Parana, and on the W. by Matto Grosso. It covers an area of 112,280 square miles, and has a coast line of more than 400 miles. The hinterland of the coast is rugged, the ranges of the Serra do Mar, Serra de Paranaipiacaba, and Serra da Mantiqueira bounding the grassy campos, or plains, of the interior. The state is watered by the numerous left-hand affluents of the Parana. The soil is extremely fertile, making the state one of the richest in Brazil. Coffee is the conspicuous product, but fine crops are yielded of sugar, tobacco, rice, maize, cotton, and beans; while great attention is also paid to the raising of live-stock. The mineral wealth comprises gold, silver, iron, and coal. The industries include iron-founding, cotton mills, breweries, distilleries, tanneries, and tobacco factories. The capital is São Paulo and the chief port Santos. Pop. (estimated), 1,700,000.

São Paulo, capital of the preceding state, Brazil, 25 miles N.W. of Santos, its port on the Atlantic. The principal buildings are the cathedral, Governor's palace, episcopal palace, law academy, polytechnic, museum, several

educational and charitable institutions, and the Ypiranga Palace, a superb structure, dedicated to the declaration of the independence of Brazil in 1822. Though founded in 1500 it has largely the aspect and conveniences of a modern city, and is a bishopric. Pop. (estimated), 110,000.

Sap, a term of popular, rather than of scientific, vegetable physiology, applying to the various juices of plants. Firstly, the drops of water containing some soluble matter that form in the vacuoles of the protoplasm of young cells are known as the watery cell-sap. Secondly, the liquid food taken in by the roots, and particularly by the fine root-hairs, from the soil, consisting of water with dissolved mineral matters, is known as the unelaborated sap. It is forced upwards in early spring by root-pressure, this being known as the rise or ascent of the sap. Its upward course, under the influence of root-pressure and, at a later stage, of transpiration, is by the vessels or tracheids in the young wood. Thirdly, the milky latex and other liquids, such as the contents of the sieve-tubes, which form part of the elaborated sap, and contain sugar, starch, albuminoid and other matters, the results of assimilation and metabolism, are also termed sap. Their course is towards all growing parts. This, together with the course of the unelaborated sap which is mainly upwards, is mistakenly known as the circulation of the sap. As there is no heart or central pumping-station, and no return of liquid to its starting point, there is no true circulation in plants.

Sapindaceæ, a large order of Dicotyledons, mostly trees and shrubs, and chiefly tropical, though the maples and some others extend into temperate regions in the northern hemisphere, but none are indigenous to Europe. The leaves vary, being either scattered or opposite, and simple, pinnate, or palmate. There are four or five sepals; as many petals; twice as many, or seven or eight, stamens; a prominent hypogynous disc; and an ovary of several one- or two-seeded chambers. The fruit is various, including the fleshy dehiscent capsule of the horse-chestnut and buck-eyes, and the double samaras of the maples. The seeds may be exalbuminous or albuminous, and the soap-nut (*Sapindus*), from which the order takes its name, is specially remarkable for its saponaceous character. Even the seeds of the horse-chestnut produce a slight lather with water. Some genera contain a poisonous principle, such as Supple Jack or Timboe (*Serjania ternata*), used to stupefy fish by the Indians of tropical South America, and Paullinia, from the seeds of one species of which, however (*P. sorbilis*), Brazilian cocoa or Guarana, a bitter astringent variety, is made.

Saponification. Soaps consist of compounds of certain organic acids with the alkaline bases. The process by which the fats are broken up into the alcohol and acids of which they are formed during the soap-formation is known as

saponification. It is, however, also extended to all other similar reactions in which an ethereal salt is broken up into its constituent acid and alcohol. Saponification may be induced by the action of acids or alkalies, and the rate at which it proceeds in different conditions has been the subject of much investigation, and assisted greatly in the building up of the fabric of chemical dynamics.

Sappan Wood, a dyewood of commerce, yielded by *Cesalpinia Sappan*, a species of a genus of the order Leguminosæ. It is a native of tropical Asia and the islands of the Indian Archipelago, but has been introduced into Brazil and the West Indies, where its cultivation has been encouraged in consequence of its valuable properties. But though it produces an excellent red colour, this is not readily fixed.

Sapper, a military engineer whose duty it is to erect field-works, usually for temporary purposes, dig trenches, and carry out similar operations. Literally he is one who saps; hence his name. A sap is a trench or ditch by means of which cover is provided for a force attacking a fort or besieged place. As the trench is excavated, the earth dug out is disposed in gabions, or large wicker baskets, along the side of the ditch, which form a bulwark for the protection of the occupants. The gabions having been filled, the earth is next thrown beyond them towards the fortress, with the intention of forming a parapet. A sap is generally made by four men working conjointly. Their work is arduous, responsible, and dangerous, and must be accomplished promptly and as thoroughly as possible, the men being covered meanwhile by the artillery of the assailants.

Sapphire, the crystalline mineral form of the sesquioxide of aluminium (Al_2O_3). It crystallises in the Hexagonal system, but its crystals, as usually found in alluvial deposits, are water-worn. It varies in colour, being black and opaque in the impure ferruginous variety known as emery, reddish-brown or white and opaque in corundum, red and transparent in the Oriental ruby, violet in Oriental amethyst, colourless in lux sapphire, and blue in the variety to which the name sapphire is popularly restricted. This blue variety is dichroic, the velvety cornflower blue of a fine stone being resolved by the dichroscope into ultramarine-blue and yellowish-green. Its colour may be due to cobalt-oxide, which is always used in imitating it. Its specific gravity is 3.9 to 4.1, and its hardness is 9 in the scale of Friedrich von Mohs (1773-1839), the German mineralogist, but blue sapphire is harder than emery, corundum, or ruby. It is unaffected by acids, but is fusible with difficulty in borax or microcosmic salt, forming a clear bead. Sapphires occur in the basalts of the Rhine Valley; rarely in North Carolina, where coarse corundum is abundant; in Victoria and New South Wales, associated with gold; in Siam; with the ruby in Burma; but the finest quality in Ceylon, in

river sand. Some of these Cingalese stones are cloudy, and when cut *en cabochon*, i.e., hemispherically, exhibit a six-rayed star or asterias. These are termed star-sapphires. The sapphire has been formed artificially, the most successful process being that of MM. Edme Fremy and Charles Feil in 1878.

Sappho, or PSAPHO, the famous Greek poetess, was born in the Æolian island of Lesbos probably towards the end of the 7th century B.C. She was certainly a contemporary of Alcæus, for fragments of an ode of his addressed to her and of her reply are still extant. Little is known for certain of her personal history, and the legend of her leap from the Leucadian promontory owing to her hopeless love for Phaon may be dismissed as untrustworthy. Her character has been the subject of controversy, but if she were no better than she should be, the probability is that she was no worse than the bulk of her sex was in the remote age in which she flourished. In the absence of details of her life it seems monstrous to regard her name as a synonym for a strumpet. Her productions, all lyrical, were arranged in nine books, and they ranked in the estimation of antiquity next to the works of Homer. The disjointed scraps that have come down to us seem to justify this praise. She has given her name to the Sapphic metre.

Saprophytes (named from the Greek *sapros*, "rotten") are plants which grow and feed upon decaying organic matter, often upon dead or decaying leaves. Though most green plants are probably in part saprophytic, and there are transition cases of plants partly saprophytic, typical saprophytes contain no chlorophyll. Among fungi many moulds, agarics, and other forms are saprophytic, whilst others are parasitic or either saprophytic or parasitic. Among Monocotyledons the bird's-nest and coral-root orchids are marked examples of saprophytism, parasitism being unknown in this class. Among Dicotyledons the toothwort (*Lathræa squamaria*) is partly saprophytic and partly parasitic, and the insectivorous Sarraceniaceæ and Utricularia, since they have apparently no digestive process, must also be classed as saprophytes. It is noteworthy that in their case, as in that of the toothwort, the absorbent organs are gland-studded leaf-structures. In both the saprophytic orchids and in *Lathræa* the leaves are reduced to brownish scales.

Saraband, a slow, stately dance, formerly popular in Spain, France, and the United Kingdom. It appears to have been invented early in the 16th century, but obscurity surrounds its origin and its name. The more generally-held theory is that it was devised by Zarabanda, a dancer of Seville, in Spain, who called it after himself, but others incline to the opinion of Sir William Ouseley (1767-1842) that it is Oriental in character and probably originated in Persia. It was primarily a *pas seul*, and there seems little doubt but that it

was at first of an immodest nature, for it was attacked by Cervantes and suppressed by Philip II. It was revived later with all the objectionable features eliminated, and was popular throughout the 17th century. As a solo the dancer carried castanets and wore bells on his feet. In England it was generally treated as a country dance. The music was in triple time, usually with a distinct emphasis upon the second beat of the measure. In the old suite it was the slow movement and was commonly placed before the gigue. There are fine examples of it in the suites of J. S. Bach and Handel, but the most majestic is that which Handel composed for his overture to *Almira*, and afterwards introduced into his *Rinaldo* to the words "Lascia ch'io pianga."

Saracens, a name applied by the Romans and Greeks to the nomadic tribes of the deserts of Syria and Arabia, who were notorious for their depredations and the ease with which they disappeared from view and eluded capture. After the spread of Mohammedanism the epithet was given to Turks and Moslems and then to all non-Christian peoples against whom, in the name of the Cross, warfare was waged. In all likelihood, whatever its derivation, the word was used generically to describe a number of barbarian tribes, just as Scythians was employed to denote barbarians of the North and Tatars (Tartars of erroneous usage) those of the East.

Saragossa, or ZARAGOZA, a province of Spain, bounded on the N. and N.W. by Navarra, on the N.E. and E. by Huesca, Lerida and Tarragona, on the S. by Teruel, on the S.W. by Guadalajara, and on the W. by Soria. It covers an area of 6,726 square miles. The surface is mainly mountainous (the highest point being 7,700 feet above the sea), and is watered by the Ebro and its tributaries. The principal crops are wheat, rye, barley, oats, maize, vines and olives. Sheep and goats are the chief livestock. The mineral resources await development, and the manufactures comprise paper, leather, soap, machinery, glass, textiles, chocolate and preserves, and there are distilleries and iron-foundries. Wine, fruit, oil, and flour are largely exported. Pop. (1900), 421,843.

Saragossa, the capital of the preceding province, Spain, 170 miles N.E. of Madrid, at the junction of the Huerva with the Ebro. The principal public buildings include the 14th-century cathedral of La Seo ("The See") and the cathedral del Pilar, of the 17th century, which owes its name to the jasper pillar on which the Virgin alighted when she manifested herself to St. James the Great (Santiago) as he passed through the city; the municipal buildings; the exchange; the Aljaferia or citadel, built by the Moors for a palace, afterwards used by the Inquisition, then as a barracks and prison, and now unoccupied; the archbishop's palace; the university,

founded in 1474; and several civil and military hospitals. The manufactures include silks and textiles, machinery, leather, soap, candles, saltpetre, chocolate, glass, porcelain, wine and brandy. Saragossa was colonised by the Romans, Augustus naming it after himself Cæsaraugusta. After the expulsion of the Moors, who had held it for fully four centuries, in 1118, it became the capital of Aragon. It is noted in modern times for its two heroic defences against the French, whose first siege was raised on August 15th, 1808, but who compelled a surrender after a second siege, when the townsfolk were on the brink of starvation, on February 20th, 1809, the losses of the inhabitants amounting to 60,000 persons in all. Pop. (1900), 99,118.

Sarasate, PABLO MARTIN MELITON DE, violinist and composer, was born at Pampeluna, in Spain, on March 10th, 1844. At the age of twelve he entered the Paris Conservatoire, where he studied the violin under Alard and harmony under Reber. Preferring the professional career of an executant, he made brilliant appearances in Paris and the chief towns of France and Spain, making his *début* in London at the Crystal Palace Concerts in 1861. He has a passion for touring, and has travelled in every country of the world, excepting Australasia. As a player he is noted alike for the purity of his style, his passion, *tendresse*, and extreme facility. His compositions—Spanish airs and dances, romances, fantasias, and the like—illustrate his skill and science as a virtuoso. He has received many honours, notably the Grand Cross of Isabel la Católica, which carries the title of Excellency, the Legion of Honour, the Red Eagle of Prussia, and the Dannebrog of Denmark. His full-length portrait by J. M. Whistler is considered one of the painter's most characteristic achievements.

Saratoff, a government of Russia-in-Europe, bounded on the N. by Penza and Simbirsk, on the E. by Samara, on the S.E. by Astrakhan, on the S.W. by the territory of the Don Cossacks, and on the W. by Voronezh and Tamboff. It covers an area of 32,624 square miles. The surface is mostly a plateau, watered by the tributaries of the Volga, which flows along its eastern boundary, and some affluents of the Don. Agriculture is the chief occupation of the people. The principal crops are rye, wheat, barley, oats, potatoes, melons, sunflowers and oil-seeds. The herds and flocks are very large, though cattle-breeding is alleged to be on the decline. Droughts and the inroads of marmots, mice and predatory insects are the farmer's too constant foes. Poultry-keeping is on the increase. The industries include flour-mills, oil-works, distilleries, saw-mills, tanneries, pottery, machinery and engineering works, tobacco factories and boot-making. Saratoff, the capital (143,431), contains one of the best provincial theatres in

Russia, and in Radischeff's Museum has a remarkably fine collection of paintings, sculpture and antiquities. Pop. (1897), 2,423,185.

Saratoga Springs, a town of New York State, United States, near the Hudson, 38 miles N. of Albany. It is the most fashionable of the inland health resorts of the Union, being noted for its carbonated mineral waters (chalybeate, sulphur and iodine) recommended for rheumatic, liver and digestive complaints. There are horse races, a flower festival in the autumn, and the other concomitants of a popular watering-place. About 14 miles to the south-east, at Stillwater, is the field of the two battles of Saratoga in the Independence War between the Americans under General Horatio Gates, and the British under General John Burgoyne (September 19th and October 7th, 1777), as a result of which the latter surrendered on the 17th of October. Pop. (1900), 13,534.

Sarawak, a district in the north-west of Borneo, constituting a rajahship, which was placed under British protection in 1888. It occupies an area of 41,000 square miles. The eastern region is mountainous, Mount Mulu attaining a height of 9,000 feet above the sea, but there is much rich alluvial soil along the seaboard. The control of the country was obtained in 1842 from the Sultan of Brunei by the famous Sir James Brooke ("Rajah Brooke"), through whose efforts piracy was extirpated and the disaffection of the natives was quelled. The inhabitants are Malays, Dyaks, Kayans, Kenyahs, and Muruts, with Chinese and other settlers. The streams are numerous but short, and include the Sarawak, Rejang, Baram and Limbang. The principal products are sago, arrowroot, pepper, rattans, rubber and gutta-percha. The mineral resources are valuable and comprise gold, antimony, cinabar, mercury, coal, diamonds, sapphires and other precious stones. The country is governed by a British Rajah, who is absolute, assisted by a council of three European residents and four natives nominated by himself. The capital is Kuching or Sarawak (30,000), about 23 miles from the mouth of the Sarawak. Pop. (estimated), 500,000.

Sarcina, a schizomycetous fungus occurring in the human stomach, especially in cases of cancer, when it is brought up in the vomit. It also occurs in similar cases in the urine of men and of animals. Its cells divide in three planes at right angles, and thus remain in minute quadrilateral groups.

Sarcophagus ("flesh devourer"), a stone coffin, especially one richly ornamented with sculptures and other decorative ornament. Probably the name was first given to coffins made of a kind of limestone found at Ascos in Asia Minor, which had the reputation of burning up a body put within it in the space of 40 days, its action apparently being like that of quicklime. Sarcophagi were used by Eastern

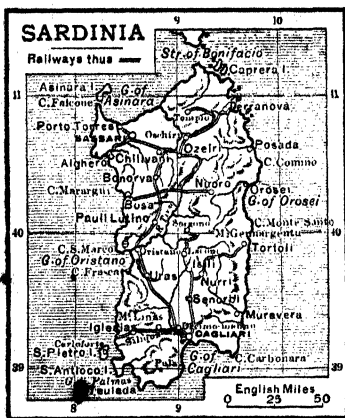
and Egyptian peoples down to the fall of the Roman Empire, and many of the examples found in Greece and Rome have historical or æsthetic value, because of the light which their adornment throws upon the artistic practices (such as painting in colours) in vogue in these countries. Owing to their costliness, for some of them were hewn out of syenite, porphyry, granite and other stones difficult to "work," and several were ornamented by the best sculptors of the time, they never came into general use. They are still occasionally employed in the sepulture of distinguished persons, as in the case of Napoleon I., whose remains were deposited in a sarcophagus in the crypt of the church of the Hôtel des Invalides, in Paris, in 1840.

Sard, a brown variety of chalcedony passing into carnelian. Its name is possibly connected with the Persian *sered*, a yellowish-red, though more probably it was derived from Sardis, the capital of Lydia in Asia Minor, being thus the "Sardian stone."

Sardine (the "Sardinian fish," French = "pilchard," common off the island of Sardinia), a trade name for young pilchards, prepared chiefly in France and Portugal by drying and salting and immersion in boiling oil. The fish are then put up in oil in tin cases for the market. They form a toothsome, appetising and wholesome food, and the readiness with which they can be made available for the table has given them a widespread popularity. Tomatoes and lemon are sometimes added. Sardines cured in red wine are sold as anchovy sardines. Sprats cured in oil are also placed on the market as sardines. In fact, the name seems to have become almost as applicable to the method of curing and packing as to any particular fish, since the young of several different kinds are now treated *à la mode de sardine*.

Sardinia, an island in the Mediterranean, 140 miles from the nearest point of the west coast of Italy, of which it forms a portion. It lies immediately to the south of Corsica, from which it is separated by the Strait of Bonifacio, about 8 miles wide. It occupies an area of 9,187 square miles, or 9,306 square miles including the adjacent islands (Antioco and San Pietro, on the south-west; Asinara, on the north-west; Maddalena and Caprera, on the north-east, besides several smaller ones). From north-east to south-west the length is 1,760 miles and the extreme width is 80 miles. The principal bays are, in the south, the Gulfs of Cagliari and Palmas; in the east, the Gulfs of Orosco, Terranova and Congianus; in the north, the Gulf of Asinara, and, in the west, the Gulf of Oristano. The chief capes are Longo Sardo, in the north; Comino, in the east; Spartivento and Teulada, in the south, and Mannu and Caccio, in the west. The bulk of the surface is mountainous, Monte Gennargentu (5,883 feet) on the parallel of 40° N. being the highest point, but there extends

from south-east to north-west the great plain of the Campidano. The streams are numerous, amongst them being the Tirso, the longest, flowing south-westwards to the Gulf of Oristano, the Porto Torres, Coghinas, Liscia, Flumendosa and Samassi. The southern half of the island is rich in minerals, which com-



SKETCH MAP OF SARDINIA.

prise argentiferous lead, silver, zinc, iron, copper, antimony, arsenic, cobalt, nickel, coal, granite, marble, alabaster and salt. During the Carthaginian and Roman occupation the mines were diligently worked, but they were neglected during the Dark Ages and it is only in modern times that they have revived. The winter is the rainy season, but the maquis, or drought, of summer is exceptionally severe and brings nearly all vegetation to a standstill. The malaria is a double curse, since it prevents immigration and, owing to the scarcity of labour, is likely to establish itself, cultivation of the soil being the most effectual remedy for it. The leading crops are wheat, barley, beans, olives, oranges, citrons, mulberry tobacco, madder and hemp. The forests largely consist of oak, cork-oak, fir and pine. Cattle, sheep, goats, asses and, particularly, horses are the principal live-stock. The fauna includes the mountain sheep, tarantula and scorpion, while mullet, eels, mussels, crabs, anchovies, sardines and coral occur off the coasts. The natives are hardy, of middle height, dark in complexion, lively, hospitable, fond of music, and strong in their family affections, but the horrible custom of the vendetta, or blood feud, is not yet extinct. Education, though compulsory, is backward. The antiquities are interesting, especially the round houses called nurhags, in the shape of a truncated cone (or a round tower cut in two), probably the dwellings of the original settlers, and the burial-places called tombs of the giants. The island is supposed to have been first colonised by Phoenicians and, after them,

by Egyptians and Carthaginians. The Romans annexed it in 238 B.C. and, in the 5th century after Christ, it was overrun by Vandals and Goths. Although the Empire recovered it, the natives expelled the Romans finally in A.D. 665. The Saracens harried it periodically till they were defeated in the Bay of Cagliari (1050) by the combined fleets of the Genoese and Pisans. The latter ultimately held the island till 1325, when it was given by the Pope to Aragon. It remained Spanish till 1713 when, under the Treaty of Utrecht, it passed to Austria which, in 1720, exchanged it with Victor Amadeus II., Duke of Savoy, for Sicily. The Duke of Savoy then called himself King of Sardinia, and in 1859 the island became part of Italy. It forms a compartimento, or department, of that kingdom, being divided into the provinces of Sassari (northern, 5,184 square miles) and Cagliari (southern, 4,122 square miles), which again are divided into districts, towns and villages. The principal towns are the capital Cagliari (53,747), Sassari (38,268), Iglesias, the mining centre, Oristano, Alghero, Tempio, and Muravedra. Pop. (1901), 791,754.

Sardis, or SARDES, the capital of the ancient kingdom of Lydia, Asia Minor, near the base of the northern face of Mount Tmolus (Kisika Mousa Dagh), 2½ miles S. of the Hermus, 50 miles N.E. of Smyrna. There is no reason to suppose that the tradition that the Pactolus, which is an affluent of the Hermus and ran through its market-place, rolled over golden sands is a figure of speech (in allusion to the prosperity, commercial and political, of the city) rather than the statement of a literal fact. It was famous as the principal centre of the manufacture and dyeing of woollen stuffs and carpets. In the later Roman and Byzantine period Sardis was magnificent and powerful, although in its earlier history it was attacked by Greeks, Persians and the outer barbarians. After its capture by Cyrus it was the seat of a Persian satrapy. The Greeks burnt it in 500 B.C. Then an earthquake destroyed it in the time of Tiberius, but he restored it. After Byzantium became the capital of the East, Sardis declined in importance and ultimately in population, and finally was taken and destroyed by Tamerlane in 1402. Save for an insignificant village, named Sart, only mounds, mostly unexplored, now indicate the site of the great and opulent metropolis of Lydia.

Sardonic, applied to a laugh or smile resulting from assumed gaiety, hence derisive, malignant, sneering, which is the current sense in which the word is used. Possibly there is a subconscious association with sarcastic. Laughter of the description indicated was formerly believed to be so named because it resembled the effect produced by a bitter herb, indigenous to Sardinia (*Herba sardonica*), which distorted the features of the partaker of it. Properly, however, the derivation of the word

is from the Latin *sardanius*, meaning "bitter," "scornful."

Sardonvz, a variety of onyx, or banded chalcedony, consisting of white or blue-grey layers alternating with red (carnelian) or brown (sard), or of all three superposed. When well and sharply coloured it is termed Oriental sardonvz; but the colours are often heightened artificially, or the sardonvz is built up of cemented layers of various chalcedonies. It has always been a favourite material for cameo-engraving, the finest, such as the "Triumph of Bacchus and Ceres" in the Vatican Museum, in Rome, which measures 16 inches by 12 inches, being cut in stone of five different layers.

Sardou, VICTORIEN, dramatist, was born in Paris on September 7th, 1831. Educated for the medical profession, he was compelled by poverty to take to writing and teaching for a livelihood. In 1854 he produced a comedy, *La Taverne des Étudiants*, which failed utterly. In 1859 appeared *Les Premières Armes de Figaro*, and its success was followed up later in the year by *Les Gens Nerveux*, at the Palais Royal. Among his best-known pieces are *Les Pattes de Mouche* (1860), *Nos Intimes* (1861), *Candide* (1862), *La Famille Benoiton* (1865), *Divorçons* (1880), *Fédora* (1882), *Théodora* (1884), *La Tosca* (1887), *Cléopâtre* (1889), *Belle Maman* (1889), *Thermidor* (1891), which, in consequence of its attack on the Great Revolution, provoked hostile manifestations and was ultimately forbidden to be acted in France, *Madame Sans-Gêne* (1893), *Pamela* (1898), *Robespierre* (1902), produced at the Lyceum Theatre, London, by Sir Henry Irving, and *Dante* (1903), produced at Drury Lane, with Sir Henry Irving in the title-part. Sardou was elected a member of the Academy on June 7th, 1877, in succession to the poet Joseph Autran. He is a master of stage-craft, and provided Sarah Bernhardt with some of her most celebrated rôles.

Sargasso Sea, a vast area of the tropical Atlantic, possibly covering as great a surface as 260,000 square miles, but the bounds of which are more or less imaginary, and the extent is indeterminate, since the so-called sea shifts its mass. Its chief characteristic is the immense quantity of sea- or Gulf-weed floating in the water, the principal component being *Sargassum bacciferum*, from which the tract derives its name. When Columbus struck this region the amount of weed was so immense that he could not understand how his ship still made way, though the former idea that the drift was so widely spread and dense as to hinder navigation has been disproved over and over again. The weeds were called Gulf, because it was once thought that they were wrenched from the coasts of Florida and the Bahamas and borne to mid-ocean by means of the Gulf Stream. Dr. Robert Brown, however, in *Our Earth and Its Story*, broaches another theory. "The chances are," he writes, "that at one time it grew on a

land surface now submerged, and that in course of time the algae have adapted themselves to their surroundings, since they now live and propagate freely on the surface of the ocean, sheltering in their thick masses great quantities of marine animals, which afford apt instances, as Sir Wyville Thomson tells us, of protective resemblances, the species, in colour, looking so like the Gulf-weed that they do not readily attract the keen-eyed seabirds, to which they would otherwise fall an easy prey." In point of fact the weed of the Sargasso Sea reproduces on a colossal scale the sudd which used to occur on the upper waters of the Nile, and which, until it was cut, did constitute a serious impediment to the navigation of the river.



SARGASSUM BACCIFERUM.
A, Under-surface of magnified frond.

Sargent, JOHN SINGER, the famous portrait-painter, was born in Florence, Italy, in 1856, of American parents. Educated in Italy and Germany, he proceeded to Paris, at the age of nineteen, to enter the studio of Carolus-Duran. After some years of study, during which he conscientiously followed the precepts of his professor, making no effort prematurely to assert his individuality, he emerged complete master of his material. The year 1879 marked the first public exhibition of his work. This was a portrait of Carolus-Duran, shown at the Salon. Its fine painter-like qualities gave promise of artistic achievement, which was afterwards amply fulfilled. From this date he continued to exhibit regularly at the Salon, chief among his early pictures being a "Portrait of a Young Lady," shown in 1881, the striking technical triumph, "El Jaleo," and "Madame Gautreau," which attracted much attention by reason of its audacious originality. In 1882 he began to exhibit at the Royal Academy, and during the next five years showed many works, among them being portraits of "Lady Playfair," "Mrs. W. Playfair," "Mrs. Vickers," and that graceful group, "The Three Misses Vickers." In 1887 his picture, "Carnation, Lily, Lily, Rose," a daring arrangement of children, Chinese lanterns, carnations, lilies, and roses, was purchased by the trustees of the Chantrey Bequest, and is now one of the treasures of the Tate Gallery. The next three years saw the exhibition of many portraits, one of them being that of "Henry Irving." In 1891 he exhibited that astonishingly clever painting, "La Carmencita," which was after-

wards acquired by the French nation, and is occasionally hung in the Luxembourg Gallery. In 1894 he was elected an associate of the Royal Academy. The same year he showed a part of his mural decoration for the Public Library at Boston, Massachusetts, the subject of it being



"LA CARMENCITA," BY J. S. SARGENT, R.A.

(Photo: N. D.)

taken from the Psalms, cvi. 21, *et seq.* In 1895 he exhibited several remarkable portraits, among them those of "Coventry Patmore"—now in the National Portrait Gallery—"W. Graham Robertson," and "Mrs. Russell Cooke." The following year produced portraits of many notable people, namely, "The Rt. Hon. Joseph Chamberlain," "Mrs. [afterwards Lady] Ian Hamilton," and "Sir George Lewis." In 1897 he was elected a Royal Academician, and in that year exhibited portraits of "Mrs. Carl Meyer" and "The Hon. Laura Lister." The following year was productive of many fine portraits, among them "Francis Cranmer Penrose, President of the R.I.B.A.," "Johannes Wolff," the violinist, "Sir Thomas Sutherland, G.C.M.G., Chairman of the Peninsular and Oriental Steam Navigation Company," and "The Rt.

Hon. Lord Watson," which was painted for the members of the legal profession of Scotland. This year, 1898, also saw the first of the famous Wertheimer portraits, those of "Asher Wertheimer" and "Mrs. Wertheimer"—the portraits of their two daughters being afterwards exhibited in 1901. The two following years produced a number of portraits of celebrities, among them being those of "Miss Octavia Hill," "Lady Faudel-Phillips," "The Earl of Dalhousie," and "Lord Russell of Killowen, the Lord Chief Justice of England." A fine portrait group of "Lady Elcho, Mrs. Adeane, and Mrs. Tennant" was exhibited in 1900, and in the same year he exhibited his Diploma picture, "An Interior: Venice." In 1901 he showed portraits of "The Hon. Mrs. Charles Russell," "Ingram Bywater, Regius Professor of Greek at Oxford University," "Sir Charles Tennant" and a large group representing "Sir Charles Sitwell, Lady Sitwell, and Family." The year 1902 saw the completion of another of his beautiful groups of three, this time of the "Ladies Acheson." The remarkably fine portrait of "Lord Ribblesdale" was also exhibited in this year, as were those of "The Duchess of Portland" and "Mrs. Leopold Hirsch." During the following years his display of portraits was undiminished, and included "Lady Evelyn Cavendish," "Mrs. Joseph Chamberlain," "The Earl of Cromer," "The Countess of Lathom," "Her Grace the Duchess of Sutherland," "Major-General Leonard Wood, of the U.S. Army," "Charles Stewart, sixth Marquess of Londonderry, K.G., carrying the great Sword of State at the Coronation, August, 1902, and his Page." In 1905 he showed portraits of "Señor Manuel Garcia," "The Countess of Warwick," and "The Marlborough Family," and in 1906 he exhibited portraits of "Field-Marshal Earl Roberts, K.G., V.C.," "The Hon. Mrs. Frederick Guest," and a large and striking group of "Four Professors of the Johns Hopkins University at Baltimore, U.S.A." Besides portraits Sargent has painted many landscapes and other pictures of much originality and power, notably "Fishing for Oysters at Cancale," "En route pour le pêche," "Neapolitan Children Bathing," as well as many water-colour sketches of Spanish and Italian subjects. In 1905 he visited the Holy Land to obtain landscape studies for his decorations of the Public Library at Boston. A painter of great versatility and strength, Sargent's work is remarkable for its profound if sometimes merciless insight into character and for the vigour and *esprit* of its execution.

Sark, or SERCQ, the gem of the Channel Islands, in the English Channel, 7 miles E. of Guernsey, from which it is usually approached, and 12 miles N.N.W. of Jersey. It has an area of 2 square miles. It consists of a northern portion, Great Sark, and a southern, Little Sark, united by a rugged isthmus of rock, called La Coupée. The tiny harbour at Creux was constructed in 1823, and is protected by a

breakwater extending nearly across the entrance. Access to the interior is had by means of a tunnel through the rock. The rock formation is extremely picturesque, now fantastic, now grand, and always varied, and the colouring is exquisite. The scanty population is engaged in agriculture and the fisheries. Sark was at

From 1579 to 1588 he was in Rome on the business of his order. Until 1605 his life was passed in the tranquillity of study and research, mathematics, metaphysics, and physiology fascinating him equally with divinity. His scientific treatises have been lost. The claim that he discovered the circulation of the blood is untenable,



SARK : LA COUPÉE.

[Photo: Chester Vaughan.]

various times a stronghold of pirates, and was occupied successively by French and English. In Elizabeth's reign Philip de Carteret, of St. Ouen, founded a colony and held the island as tenant of the British Crown. Since then it has several times changed hands, but remains a curious survival of a mediæval Norman manor under its Seigneur, the representative of the British sovereign. The Seigneurie stands in beautiful grounds, extending to the cliffs on the north side of the Port-du Moulin. The old Seigneurie, built in 1565, is now the rectory house. Pop. (1901), Great Sark, with 1,035 acres, 463; Little Sark, with 239 acres, 41—total pop., 504.

Sarpi, PIETRO, theologian, historian and patriot, was born at Venice on August 14th, 1552, and entered at an early age the Servite order of Augustinians, and was known as Fra Paolo. He soon made a name, not only as a theologian, but also as a mathematician and orientalist, obtaining a professorship at a convent in Venice.

but we owe to him the discovery of the contractility of the iris. This illustrious philosopher and statesman was a friend of freedom of thought, and incurred the enmity of Rome by his toleration of Protestantism. When Pope Paul V. attempted to interfere in the temporal affairs of Venice (1605) Sarpi did not hesitate to throw in his lot with the Republic, and his brilliant tracts largely led to the virtual overthrow of the papal pretensions in 1607. The reply of his enemies was characteristic, for a band of braves attempted to assassinate him in the same year. "Agnosco stylum Curiae Romanæ" ("I recognise the style [with alternative sense of stake, a subtle word-play] of the Roman Court"), was Sarpi's pungent and witty comment when the surgeon remarked on the ragged and clumsy wounds that had been inflicted. With broken health he retired to his cloister, and composed the powerful works on which his fame now rests, though he never avowed their authorship, namely, *The History of Ecclesiastical Benefices* (1610), the treatise

concerning *The Inquisition* (1615) and *The History of the Council of Trent* (published first in London in 1619). He died in Venice on January 15th, 1623. His last words were for his country, "Esto perpetua" ("Live for ever").

Sarracenia, a small genus of North American insectivorous plants known as side-saddle flowers, the type of the order Sarraceniaceæ, a dicotyledonous family allied to the water-lilies. There are six or seven species and various hybrids, inhabiting the swamps of the Mississippi Valley and extending into Canada. They have a rosette of pitcher-shaped radical leaves and solitary flowers. The pitchers have a honey-secreting external flange, and secrete water in which many insects are drowned from time to time. There are downward-pointing hairs which detain these insects, and the glands on the lower part of the inner surface absorb the products of their decay. There is no true digestion in the proper sense of the term. Moths lay eggs in the putrefying



SARRACENIA.

mass, the stench from which, where these plants cover acres of swamp, is unbearable; and birds slit the rotting pitchers for the sake of the maggots, so that probably a large portion of the organic matter is absorbed as a manure by the roots. The flowers have five imbricate sepals, five petals, numerous hypogynous stamens, and a five-chambered ovary, the umbrella-like expansion of its style giving the plant its popular name. *S. purpurea* is half-hardy, and the other species are greenhouse plants. The allied monotypic genera *Darlingtonia* and *Heliamphora* inhabit California and British Guiana respectively.

Sarsaparilla, the long fibrous rhizomes and roots of several species of the genus *Smilax*, a group of prickly climbing shrubs, with cordate, net-veined leaves and stipular tendrils, natives of the tropics, the type of a sub-order of Liliaceæ. The flowers are dioecious, and the plants grow in swampy forest-regions little visited by Europeans, so that there is some doubt about the species; but Mexican sarsaparilla is believed to be produced by *S. medica*, and the "Jamaica" sarsaparilla from Guatemala and Colombia, formerly shipped from Jamaica, by *S. officinalis*. The former is known as "mealy" from an abundance of starchy matter under the rind; the latter, the most esteemed, as "red-bearded," from the colour of the rootlets. Other commercial varieties are Lima, Honduras, Guatemala, and Guayaquil sarsaparillas. When boiled, the roots yield an extract, the quantity and

acridity of which is the test of the quality of the sample. In addition to starch, resin, and oxalate of lime, there is a crystallisable neutral substance known as parillin. There are three preparations of this drug in the British Pharmacopœia. The compound decoction of sarsaparilla was at one time a very favourite remedy in cases of syphilis and rheumatism, but it is not now often used, though in popular favour as a blood-purifier.

Sarsenstone. [SANDSTONE.]

Sarsfield, PATRICK, titular EARL OF LUCAN, soldier, was born at Lucan, near Dublin, in what year is unknown, and educated at a military college in France. He entered the army in 1678 and seems to have been something of a fire-eater. He actively supported James II., whom he followed into exile. He returned with him to Ireland in 1689 and organised the defences for the former king, taking part in the engagement at Newtown Butler and the capture of Sligo. At the battle of the Boyne (July 1st, 1690) his cavalry was so badly posted he could not do anything and accompanied James in his flight to Dublin. He especially distinguished himself by the rapidity of his movements on the Shannon and his defence of Limerick, the "city of the violated treaty." The soldiers were devoted to him and their affection thwarted the designs of the politicians who detested the sincerity by which he was animated. He was created Earl of Lucan in 1691 (the title of course, carrying no weight). After the reverse at Aughrim (July 12th), which was not due to any fault of Sarsfield's, but to the jealousy of his senior in command, he retired again upon Limerick, and was the heart and soul of its second defence. Some English officers having said they had seen no great improvement in Irish valour, Sarsfield retorted, "As low as we now are, change kings with us, and we will fight it over again with you." When the battle of La Hogue (1692) dissipated for good all dream of an invasion of England from France, which was to have been entrusted to Sarsfield, he became a French marshal, fought at Steenkirk on August 3rd, and was mortally wounded in the battle of Landen on August 19th, 1693, in the attack on the village of Neerwinden, and died two or three days afterwards.

Sartes (Turki, *Sart* = "trader"), a term of wide application, but of no ethnical value, in Central Asia, being applied to peoples of Aryan and Mongol stock indifferently, and simply meaning, in the first instance artisans, townsmen, traders, peasants, and then the settled populations generally, as opposed to the nomad element. The Iranian Tajiks, being always settled, were the first to be known as Sartes, hence the erroneous impression that the word had a racial meaning, implying an Iranian, in contradistinction to a Turanian people. There are Usbeg and other Tatar Sartes as well as Iranian Sartes in Bokhara,

Khiva, and throughout Turkestan generally; but the vague use of the word and ignorance of its true meaning have caused great confusion in ethnological works treating of these regions.

Sarthe, a department of France, bounded on the N. by Orne, on the N.E. by Eure-et-Loir, on the E. by Loir-et-Cher, on the S. by Indre-et-Loire, on the S.W. by Maine-et-Loire, and on the W. by Mayenne. It occupies an area of 2,410 square miles. The chief rivers are the Sarthe, Huisne and Loir, and the highest point of the surface is 1,115 feet above the sea. The department is noted for its horses (in which speed and strength are united) and poultry, and the raising of live-stock generally is vigorously pursued. The principal crops are wheat, rye, barley, oats, maize, hemp, man-golds, apples, potatoes, beans and beetroot, and a large quantity of wine is produced. The prevailing trees are oak, wych elm, chestnut, pine, beech and hazel. The minerals include coal, iron, marble and magnesia. The manufactures comprise linen, cotton, woollens, paper, glass, pottery, tiles and flour, and there are iron foundries, copper and bell foundries, engineering works and distilleries. Sarthe was created in 1790 out of part of Maine, Anjou and Perche. Le Mans (63,272) is the capital. Pop. (1901), 422,699.

Sarto, ANDREA DEL (ANDREA VANNUCCI), painter, so called because his father was a tailor, was born in Florence, Italy, in 1486 or 1487. In 1509 the Servite brothers employed him to paint the three frescoes in the porch of the Annunziata, and were so pleased with the result that they ordered four others. About 1517 he executed for the church of San Francesco, in his native city, a "Madonna with the Harpies" (now in the Uffizi Gallery), esteemed by some his *chef d'œuvre* in oil, and, while still young, painted a very vigorous rendering of "The Fathers Disputing on the Doctrine of the Trinity" for the monastery of St. Gall. Francis I. invited him to Paris, 1518, paid him well, and sent him home with money to buy for him examples of Italian art, but Andrea is said to have appropriated the amount. After his return he produced the figures of "Faith" and "Charity" in the Scalzo, the "Dance of Herodias' Daughter," "The Beheading of John the Baptist," "The Visitation," and "The Birth of the Baptist" in the same cloister. His most celebrated fresco is the "Madonna del Sacco," painted for the Servites in 1525, which was preceded (1523) by a copy of Raphael's "Leo X.," which was so faithful that it was almost impossible to distinguish it from the original. His last great achievement, "The Last Supper," at San Salvi, was finished in 1527, and he died in Florence, on January 22nd, 1531.

Sartoris, ADELAIDE, younger daughter of Charles Kemble, niece of Mrs. Siddons, was born in London about 1814. Gifted with a fine voice, she was trained to become a professional

singer, but nervousness marred the effect of her earliest appearances on the concert platform in 1835. She went abroad to complete her musical education, and while in Italy the great dramatic soprano, Pasta, gave her daily lessons. Her first appearance in opera, as "Norma" in Venice, 1839, was brilliantly successful, and her reputation was increased in other Italian cities during 1840. Returning to England in 1841 she appeared at Covent Garden with equal success, her acting and singing helping to revive the fortunes of that theatre. She sang frequently in London and the provinces, but retired from the stage on December 23rd, 1842, on her marriage with Edward John Sartoris, of Titchfield, Hampshire, early in the following year. Henceforth she sang "as if inspired" only in private society, devoting her abilities to literature and art. Her best-known work, *A Week in a French Country House*, published in 1867, is distinguished by its humour and delightful freshness. Mrs. Sartoris died on August 4th, 1879. Her intellectual gifts were of a high order. Chorley considered her the greatest, though not the best, English singer of the century, while her sister, Fanny Kemble, thought her dramatic powers overshadowed and hampered her singing and regretted she had not devoted herself to the drama.

Sarum. [SALISBURY.]

Saskatchewan, a river of Canada, rising by two headwaters, the North Saskatchewan from the eastern spurs of the Rocky Mountains in 52° 8' N. and 117° 5' W. and the South Saskatchewan, also issuing from the Eastern Rockies (Devil's Head Lake) in about 51° N. and known in its upper stream as Bow River. Both branches pursue winding courses, the northern through Alberta, the southern through Alberta and Assiniboia till they join in the province of Saskatchewan in about 105° W. Thence the river flows in a mainly easterly direction to Cedar Lake and its final discharge in Lake Winnipeg. The total length is estimated at 1,200 miles. The North Saskatchewan is open to steamers as far up as Edmonton, a distance of 850 miles.

Saskatchewan, a province of Canada, bounded on the N. by Athabasca, on the E. by Keewatin, on the S. by Manitoba and Assiniboia, and on the W. by Alberta. It occupies an area of 250,650 square miles. The Saskatchewan and its northern head and their tributaries constitute the streams and the Pasquia Hills are the chief heights. The climate is cold, but healthy and exhilarating. Agriculture is the outstanding industry, wheat, oats and barley being grown over wide tracts. Battleford (about 400), on the North Saskatchewan, is the capital. Pop. (1901), 91,460.

Sassafras (*Sassafras officinale*), a North American tree belonging to the Laurel tribe, the essential oil contained in the root, wood,

and bark of which is aromatic, stimulant, and sudorific. Though little more than a bush in northern latitudes, it attains to a height of 50 feet in the south. It is used in the United States in rheumatism and skin-diseases, but chiefly by perfumers and soap-makers, and to scent tobacco and flavour various articles. An infusion of the bark or wood is said to make a pleasant beverage and was once purveyed in the streets of London under the name of Saloop. It was apparently much appreciated by toppers (and even regarded as a cure for inebriety), and its sale was most general between midnight and the early hours of the morning. Charles Lamb averred that it "hath to some tastes a delicacy beyond the China luxury." The wood and bark yield a yellow dye; the tree is often grown in England for ornament.

Sassanids. [PERSIA (History).]

Sassari, a province and its capital in the north of the island of Sardinia, Italy. The area of the former is 4,122 square miles, but it is more rugged and less populous than the southern province. The town of Sassari is situated in the north-western angle, about 12 miles S.W. of the coast town of Porto Torres, with which it is connected by railway. It has an elevation of some 650 feet above sea-level, and was formerly surrounded by a wall and towers, built in the 15th century, which is the date also of the castle. It has a 15th-century cathedral, and is the seat of a university. Pop. (1901), 38,268.

Satan. [DEMONOLOGY.]

Satara, a district of the Deccan division of Bombay Presidency, British India, bounded on the N. by Bhor and Phaltan and the Nira, on the E. by Sholapur and Jat, on the S. by the Varna and Kolhapur, and on the W. by the Sahyadri hills. It covers an area of 4,988 square miles. There are two principal hill systems, the Sahyadri, on the western boundary, running north and south, and the Mahadeo, extending towards the eastern boundary. The district is the head valley of the Kistna, but the Bhima, with its affluent the Nira, cross the north-east and the Varna flows along the south. Among the fauna tigers, bears, hyenas, bison, wild boar, sambur, jackals and hares occur. Agriculture is the leading occupation, the chief crops being sorghum, bajra, rice, cotton, millet, oil-seeds, sugar and potatoes and other European vegetables. Iron and copper are plentiful in Mahabaleshwar, but are not worked so much as they once were. Cotton, blankets and brassware are the principal manufactures. Satara formed the centre of the Maratta power founded by Sivaji about 1644, but, after several conflicts with the British, the territory was annexed by Great Britain in 1818. A generous experiment of allowing the Rajah to rule ultimately had to be given up and Great Britain resumed full control in 1848. Satara (29,600), 56 miles south of Poona, is the capital

and, lying 2,320 feet above the sea, has a delightfully invigorating climate, though it is not otherwise a notable town. Pop. (1901), 1,146,521.

Satellites are small celestial bodies attendant on the planets. They rotate round the planet, which is often called the primary, and which controls their motion. The inferior planets, Mercury and Venus, are unaccompanied by any satellites, while the Earth's attendant, the Moon, is naturally by far the best known of all. Venus was formerly believed to possess a satellite, first pointed out by Francesco Fontana in 1645, and many astronomers in the 16th and 17th centuries testified to its existence. Later work has, however, proved that some of the astronomers mistook certain stars for the satellite, while the others must be considered as the victims of illusion, since Venus has no obvious moon. Since the Middle Ages Mars has been credited with two satellites, which, however, do not appear to have been actually seen till 1877, since when they have been repeatedly observed. They are called Deimos and Phobos, and their diameters have been estimated as six and seven miles; they are therefore the smallest known satellites. Jupiter has five satellites, four of which were discovered by Galileo, while the fifth was first noted in September, 1892, by Professor Bernard at the Lick Observatory. All lie very nearly in the plane of Jupiter's equator. The first four are visible even with the feeblest telescope, but the fifth is so small, being only about 100 miles across, and moves so rapidly, that it is nearly always invisible, for it fades away in the presence of the slightest amount of light from Jupiter. All Jupiter's satellites revolve more rapidly than does our Moon, the last discovered taking rather less than twelve hours, only two hours longer than Jupiter's own period of rotation. Between the first three satellites there are curious relationships. The mean motion of the first, together with twice that of the third, is equal to three times that of the second, and also the mean longitude of the first, together with twice that of the third, is equal to three times that of the second, increased by 180° ; hence they cannot be all three eclipsed at one time, although each is eclipsed at every revolution. The times of the eclipses of these satellites have been recorded over a very long period, and their recurrences predicted. Careful observation led to the discovery that a certain difference was obtained between the observed time of an eclipse and the predicted time; the eclipse occurred before it was expected when Jupiter was nearest to the Earth, whereas it happened later when Jupiter was farthest away. This led to the idea that light took a definite time to travel, and, since the distance of Jupiter from the Earth in the two cases was known, this gave a means for measuring the velocity of light. The satellites are not only rendered invisible to us because

they pass into the dark shadow of Jupiter cast by the sun, but they may actually pass behind the planet himself, in which case they are occulted. The moments when an occultation begins or ends are not nearly so sharply defined as the time of an eclipse, since it is difficult to see the satellite when it is at the very edge of Jupiter's disc. It is similarly difficult to see the satellite when it is pursuing a transit in front of the planet, but it generally casts a shadow, which is seen as a small dark moving spot on the planet's face. The detection of Saturn's satellites has extended over many years, from the discovery of the first by Huygens in 1655, followed by the finding of four more by Cassini later in the same century, and another two by Sir William Herschel, to the simultaneous observations made by William Lassell (1799-1880) at Liverpool and George Phillips Bond (1825-65) in the United States on September 19th, 1848, of a small moon far away from the planet, and the further discovery of a ninth in 1899. Huygens' satellite is the largest one known, its diameter being about 3,300 miles. The four moons of Uranus have their orbits in the same plane, and this plane is nearly perpendicular to the plane of the planet's orbit. This fact is curious and unique, while it is also remarkable that the orbits of the satellites appear to be perfectly spherical. Neptune, like the Earth, possesses only one satellite, which revolves round its master in about six days.

Satin, a soft and closely-woven kind of silk to which a brilliant gloss is imparted by making the warp appear above the weft. It is manufactured largely at Lyons, Florence, and Genoa, and India and China produce plain, damasked, or embroidered satins, which are less bright than those of Lyons, but retain their brilliancy longer.

Satin-Bird (*Ptilonorhynchus holosericeus*).
[BOWER-BIRD.]

Satinwood, a handsome light-coloured hard wood, with satin-like lustre, generally with a curled mottling of the grain. It is used in veneering and inlaying, and especially for the backs of hair-brushes. In the 18th century it was frequently employed in furniture ornamented with paintings. That from the East Indies is the product of *Chloroxylon Swietenia*, an ebenaceous tree, and is imported in round logs: the better quality, from Nassau in the Bahamas, in square logs, is the product of another tree of the same order, probably *Maba guianensis*.

Satire, a pungent ridicule much employed by poets and prose-writers to lash the follies and vices of the age or society in which they live. The Greeks did not make much use of satire proper, but it flourished among the Romans, and was used with effect by its inventor Lucilius and the later poets Horace, Juvenal, Persius, and others. Among English satirical writers may be mentioned Alexander Pope and Dean Swift while Robert Burns's "Holy

Willie's Prayer," though not ostensibly a satire, is the most scathing exposure of cant and hypocrisy ever written.

Satrap, the governor of a province in ancient Persia. In power he was well-nigh absolute. and in the general decay that befell the country after the time of Cyrus (d. 529 B.C.) many of the satraps transformed themselves into independent kings. The word also came to mean any official acting despotically under an autocrat or tyrant.

Saturn, in Roman mythology one of the most ancient of the gods, and associated in primitive times with agriculture (*serere, satus*, "to sow"), his wife being Ops, whose name signifies "plenty." He was usually represented as an old man bearing a sickle; the substitution in later ages of a scythe and the addition of wings and an hour-glass were due to his confusion with the Greek Kronos, connected by an etymological error with *chronos*, "time." Kronos was the youngest son of Uranus and Gæa, the brother and husband of Rhea, and the father of Zeus. Owing to a prophecy that he would be deposed by one of his children, he devoured them all save this last, for whom Rhea substituted a stone. Zeus fulfilled destiny by thrusting his father and the Titans into Tartarus, and putting an end to the Golden Age. The Saturnalia, the greatest festival of the Roman year, was latterly celebrated from the 17th to the 21st of December. It was a season of extraordinary rejoicing, when slaves sat at a table with their masters and were even waited upon by them, when schools were closed and the children had a good time, when punishments ceased to be imposed, and hilarity and enjoyment prevailed. Latterly the festival degenerated into a display of general licence and riotousness, and so came to be synonymous with an exhibition of wanton and disgusting conduct under the guise of a holiday. So long established was the worship of Saturn that the most archaic metre in use among the Romans was named Saturnian in his honour. In later days, as we learn from Aristotle, Cicero and others, a planet was called after him, and his name was also bestowed upon one of the days in the week, Saturday being Saturn's day.

Saturn was recognised as a planet by the ancients, and was the outside member of the solar system as known by them. So far from the sun is he that 29½ years are spent by him in going once round his celestial path. His orbit is about 2½° from the elliptic, and is an ellipse differing considerably from a circle, his greatest distance from the sun being about 921,000,000 and his smallest about 823,000,000 miles. His diameters at the equator and poles differ considerably, the protuberance at the equator giving him there a diameter of 74,000 miles, while at the poles it is only 68,000. His rotation about his own axis is very rapid, taking about ten hours and a half, a number

slightly exceeding that of Jupiter, while the plane of his equator makes an angle of about 27° with the plane of his orbit. In size Saturn is the largest of the planets except Jupiter, being in fact 700 times larger than the earth, but his density is so small that he would be able to float on water far more easily than an iceberg. From this it follows that he cannot consist of solid or liquid matter, and in fact we can only view a mass of clouds intensely heated within, the whole being probably a planet in the early stage of development—younger even than Jupiter. The most remarkable characteristic of Saturn, which makes him an object of such interest in the sky, is his possession of a luminous ring. This was originally discovered by Galileo, who first thought that the planet was merely attended by two other bodies, one on each side of it, these two objects gradually fading away till the planet appeared alone, but reappearing later. Their true nature was afterwards explained by Huygens, who showed that these changes could be accounted for by a thin opaque circular ring surrounding the planet's equator, though at some distance away, and accompanying the planet on his travels. The ring is only luminous on account of its reflection of the sun's light; hence it will be invisible to us when, for instance, we are endeavouring to look at the ring from below while the sun is shining above. It also sometimes happens that the plane of the rings passes through the sun or through the centre of the earth, in which case only the thin edge of the rings can be seen at all; unless then a powerful telescope is being used, nothing will be visible. Cassini, in 1675, showed that the ring was divided into two parts, the inner being the wider, and later another faint division appeared to divide the outer part into two smaller rings. In 1850 another ring was discovered by Professor George Phillips Bond in the United States and William Rutter Dawes (1799-1868) in England; this is quite different from the outer rings, being dark, and generally known as the dusky ring of Saturn. The outer ones, though far from solid, can receive a shadow of Saturn, and themselves cast one on his disc. The dusky ring can do nothing of the kind, and its filmy nature doubtless prevented its earlier discovery. That the rings must rotate about the planet is necessary for their existence, and Sir William Herschel demonstrated that they actually did so, by observing the motion of tiny spots of light upon them. James Clerk Maxwell demonstrated that the rings are not continuous masses of matter, but consist of countless myriads of tiny satellites, so close together that to us they appear as one body. From observations made over a considerable period, it seems that the inner edge of the bright ring is gradually approaching the planet, while the outer edge of all is getting farther away, thus increasing the breadth of the bright rings. The planet has nine satellites, which seldom

pass behind or in front of the planet's disc, and therefore are not objects of great interest. The ninth satellite was not discovered till 1899.

Satyr, a class of beings of Greek mythology, connected generally with the worship of Dionysus, and represented as the offspring of Hermes and the Naiade, and figuratively taken as illustrating the vital powers of Nature. They are first mentioned by Hesiod. In art they are divided into full-grown Satyrs, of whom Silenus may be taken as a typical example, and the little imp-like Satyrisci, a kind of rustic Cupids. They were much given to wine, and to sensual delights generally. At a later period they were confounded with the Fauns, and also served as a model for the modern vulgar conception of the Devil's personal appearance. Edmund Spenser has embodied them in his *Faerie Queene*.

Sauerkraut, a popular German dish thus prepared: White cabbage is shred, and placed in layers in a cask with salt, juniper, cloves or caraway or other condiments. These layers are allowed to ferment under pressure until they become sour, the resulting liquor is poured off, and salt water added till scum ceases to rise. The mixture is then kept in a cool place, and under pressure, till needed for consumption.

Saul, the first King of Israel, was the son of Kish, a noble and opulent member of the warlike tribe of Benjamin, whose home was in the little city of Gibeah. Distinguished by his great stature and virile beauty, at the time he was anointed the first King of Israel, Saul was in the full vigour of manhood, being about forty years old, a giant king called to contend with a race of giant invaders. At his election we first hear the familiar cry "God save the King"; but some malcontents, probably leaders of the greater tribes of Judah and Ephraim, refused him the usual tokens of homage. Opposition was soon silenced by his victory over Nahash, King of Ammon, who had besieged Jabesh-gilead. Rousing his nation by a strange war-signal, powerful as the fiery cross of the Gaelic chiefs, whose effect was instantaneous, he overcame the Ammonites. He was now universally acknowledged as sovereign and constrained to assume the royal state. He gathered an army of 3,000 chosen men and set to work to free his country from the Philistines. His son Jonathan hastened the struggle by the slaughter of a Philistine officer (or garrison) and the Philistines answered the challenge by gathering a large army. The Israelites, terrified, fled into hiding. Saul, with 600 men, retired to Gilgal, where he waited for Samuel seven days as the prophet appointed. Full of impatience, he offered up sacrifice, and as the offering was ended Samuel came. Saul pleaded his fear of attack, but the prophet reproved his disobedience, and the first rejection of the king was pronounced. The impetuous courage of

Jonathan at Michmash, where he overwhelmed the outpost which watched him, led to the utter rout of the Philistines. This was followed by Saul's victory over the Amalekites, whom he was commanded to root out. But Agag, their king, was spared with the best of the spoil, and Samuel, at his coming again, reproved Saul for disobedience, and once more the sentence of his rejection was declared. The old prophet mourned for the unhappy king, who was now visited by deep melancholy and fits of madness. A skilful musician was sought to soothe him, and thus was David, the young shepherd minstrel, introduced into Saul's presence. As he played, "the evil spirit departed." He became the king's armour-bearer. For his slaughter of the Philistine champion, when the Philistines again attacked the Israelites, he obtained Saul's daughter in marriage. But when he won the love of Jonathan and the applause of the people, Saul's suspicious fears led him to seek David's life. Yet again the Philistines came up against the Israelites. In despair, Samuel being dead, Saul, disguised, went to consult the witch of Endor, through whom he learned that his kingdom was given to David, and that on the morrow he should suffer defeat and death. The Israelites fled, Jonathan and his two brothers were slain, and when, sorely wounded, Saul entreated his armour-bearer to kill him, the attendant was reluctant to do his bidding, and Saul fell upon his heavy sword; the faithful follower did not hesitate to share his fate, likewise slaying himself. So Saul died upon Mount Gilboa, and it was left to his successor to complete his work of ridding the kingdom of the enemy.

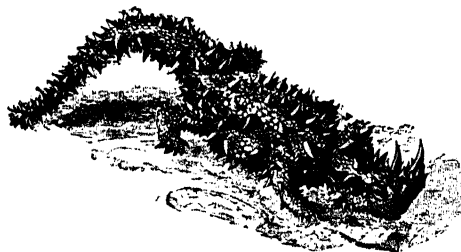
Sault Sainte Marie ("the Falls of St. Mary"), capital of Chippewa county, Michigan, United States, on St. Mary's River, at its efflux from Lake Superior, 150 miles E. of Marquette. It is connected by bridge with Sault Sainte Marie, Ontario, on the opposite side of the river. Owing to the obstruction of navigation caused by the river, which here drops 20 feet in the course of a mile, ship canals were built to connect the navigable portions of the stream. On the American side the old Soo Ship Canal was opened in 1855: it is more than a mile long, is 100 feet wide, 12 feet deep, and has two locks each 350 feet long. The Michigan Canal was opened in 1896. It is 2,330 feet long, 108 feet wide, and has an immense lock capable of accommodating vessels of 21 feet draught. On the Canadian side a canal was opened in 1895. It is two-thirds of a mile long and has a lock 900 feet in length. These canals cope with an enormous traffic every year. The manufactures of the town comprise paper, flour, woollens, engines and boats, in addition to fish-packing and the lumber trade. Pop. (1900), 10,538.

Saumarez, JAMES, BARON DE, admiral, was born at St. Peter Port, Guernsey, on March 11th, 1757, and entered the navy as a midship-

man at the age of thirteen. He first distinguished himself in the attack on Charleston (1776), and was twice promoted for bravery. His capture of the French frigate *Réunion* (1793) brought him knighthood. He was second in command at the battle of the Nile (1798), gained a great victory off Cadiz in 1801, in which year he was created a baronet, and commanded the Baltic fleet in 1809. In 1814 he was promoted admiral, in 1819 rear-admiral, and in 1821 vice-admiral. Ten years later he was raised to the peerage and died in Guernsey on October 9th, 1836.

Saumur, a town in the department of Maine-et-Loire, France, on the left bank of the Loire, 38 miles W. by S. of Tours. It contains interesting churches, a castle (11th century), almshouses, quaint specimens of domestic architecture, and many Celtic and Roman antiquities. It is also the seat of a large cavalry school. Sparkling white wine is the most important product, but linen, enamels, glass wares and leather are manufactured. There are numerous caves along the Loire and the Thouet, its lefthand affluent, probably the dwellings of prehistoric folk. Saumur became distinguished as the headquarters of liberal French Protestantism, but its prosperity was seriously endangered by the revocation of the Edict of Nantes, when three-quarters of its population sought the hospitality of more tolerant countries. Pop. (1901), 14,260.

Sauria, or LACERTILIA, an order of the class Reptilia, presenting remarkable diversity of shape and habits. Some resemble the crocodiles in appearance, though (save exceptionally) not in size, but are without the bony-plate



MOLOCH LIZARD.

armour and teeth implanted in sockets. Others follow the lizard type, while others are more or less limbless, and a few suggest the form of the serpent. The order is usually divided into the following sub-orders:—The Fissilingues, or Split-tongued Lizards, including the Common Lizard, the Teguexin, the Nile Monitor, and the *Heloderma* of Mexico; the Crassilingues, or Thick-tongued Lizards, including the Iguana, Basilisk, *Amblyrhynchus*, Flying Lizard, Moloch, and Gecko; the Rhynchocephala, or Beaked Lizards, created apparently for the Tuatara or *Sphenodon* of New

Zealand; the Vermilingues, or Lizards with worm-shaped tongues, to which the Chameleon belongs; the Amphisbæna, or Annelata, including the Amphisbæna of Brazil, a creature that looks like a worm, 20 inches long and over an inch in diameter; the Brevilingues, or Short-tongued Lizards, including the Skink, Blind-worm, Javelin Snake and the Zonurus. Huxley emphasised the relationship of birds and reptiles by placing them in a group which he called Sauropsida.

Saurians, a general term applied to more or less lizard-like fossils, some of which are Amphibia, though the majority are reptiles, and some of which attained enormous dimensions. The Labyrinthodont Archeosaurus, from the Carboniferous system, and the Mesozoic Ichthyosauria, Plesiosauria, Pterosauria, Dinosauria, and Mosasauria are among the chief types. Many of these were marine in habitat, being equipped with paddles. In addition there were flying reptiles such as the Pterodactyles, which were furnished with flying membranes, and, judging from the enormous expanse of wing possessed by some (varying from 10 to 25 feet), must have been capable of sustained flight.

Saurin, JACQUES, Protestant pastor, was born at Nîmes, in France, on January 6th, 1677, and studied theology at Geneva under Turretin. In 1701 he accepted a call to the Walloon communion in London, but, the climate disagreeing with him, removed to The Hague in 1705, where a church was formed for his services. Though known to be a Calvinist and despite his fervid pulpit eloquence, he was made the butt of heresy-hunters, to whom he replied in sermons, pamphlets and books from time to time. He died at The Hague on December 30th, 1730. His chief works were *Sermons sur divers textes de l'Ecriture Sainte* (1708-32, 9 vols. in 8) and *Discours sur les Evénements les plus considérables de l'Ancien et du Nouveau Testament* (1720-8). Formerly familiarly known as "Saurin's Bible," the latter was the work upon which were based the chief charges of heterodoxy.

Sauropsida. [SAURIA.]

Saururus, or LIZARD-TAILED BIRDS, the third division of the class birds, was created for the reception of a single representative, *Archæopteryx lithographica*, so named because the fossil remains were found in the lithographic stone, of Jurassic age, from Solenhofen in Bavaria. The first discovery was made in 1861 by Herman von Mayer, who found the impression of a single feather, while later in the same year the greater part of a skeleton was excavated in the same quarries. This second example was secured for the British Museum, and from Sir Richard Owen's memoir it appeared that impressions of the feathers of tail and wings were singularly well preserved. The head, neck and dorsal vertebrae are wanting, the head being placed in the Berlin

Museum. The feature of exceptional interest was the tail, which consists of twenty narrow, elongated vertebrae, the size of which regularly diminishes, the last being the smallest. In the majority of recent birds the tail is short and powerful, composed of not more than nine vertebrae, the last almost always being the largest. The lizard-like tail of *Archæopteryx*, therefore, suggested that its owner might be regarded as the type of animal intermediate between the reptiles and birds, a possible missing link, since birds are supposed to be reptiles in which the function of flight has become specialised. *Archæopteryx*, thus regarded, would be a flying feathered animal with a long reptilian tail. Owen, however, considered it to be neither a reptile nor a transition form but a true bird. The size of its body was conjectured to be that of a rook.

Saury, SAURY PIKE or SKIPPER, a fish belonging to the Physostomous genus *Scombresox*, with five species widely distributed in the open sea. As in the Garpikes, both jaws are prolonged into a kind of beak, and set with small teeth; behind the anal and the dorsal fins are a number of detached finlets. The Common Saury (*Scombresox saurus*) is about 18 inches long, dark above and silvery-white below. It is abundant on both sides of the Atlantic, and in Great Britain is often called the Skipper, from its habit of rushing along the surface of the water to escape from the porpoises and carnivorous fishes. It is able to maintain this movement—which has been likened to that made by a flat stone in the amusement called "ducks and drakes"—for more than a hundred feet, seemingly by repeated contact on the water with the pectoral, ventral and other fins and finlets on the lower part of the body. Several thousands have occasionally been captured in a single cast of the seine net.

Saussure, HORACE BÉNÉDICT DE, physicist, was born at Geneva, Switzerland, on February 17th, 1740. His father, Nicolas de Saussure (1709-90), was a farmer at Conches, on the Arve, of decided ability and enterprise. Horace spent his youth on the farm and thus acquired his love of Nature, which became the passion of his life. He took early to science, and at the age of twenty-two was appointed professor of philosophy in Geneva, resigning his chair to Marc Auguste Pictet-Turrettini (1752-1825) in 1786. He ascended Mont Blanc in 1787, and his work, *Voyages dans les Alpes*, served as a textbook for future investigators. His *Essai sur l'Hygrométrie* was one of the first attempts to apply scientific methods to atmospheric phenomena, and he bestowed much attention on the geological formation of Switzerland. He died at Geneva on January 22nd, 1799. His son, NICOLAS THÉODORE DE (1787-1845), born at Geneva, achieved considerable reputation as a chemist. He fixed the composition of ethylic alcohol and ether, and studied especially fermentation and the conversion of starch into

sugar. His numerous papers were published in book form as *Recherches Chimiques sur la Végétation*.

Savage, RICHARD, poet, claimed to be the natural and neglected son of Lord Rivers and the Countess of Macclesfield, and was born in 1697. Recent investigations lead to the almost irresistible conclusion that this story has no foundation (*Notes and Queries*, 1858) and that it was invented by Savage for the purpose of levying blackmail on his alleged mother. Nothing certain is known of him until 1717, when he published *The Convocation*, an attack in verse on Bishop Hoadly. His comedy, *Love in a Veil*, was produced at Drury Lane in 1718, and in 1723 his tragedy of *Sir Thomas Overbury* was brought out at the same theatre. For some years as an actor and playwright he led a reckless, disorderly, and wretched existence, being in 1727 condemned to death for killing a man in a duel; he was pardoned, and shortly afterwards wrote *The Bastard*, a savage poetical onslaught on his mother, whose nephew, Lord Tyrconnel, gave him a pension of £200 to refrain from further attacks. In a brief period of tranquillity he composed *The Wanderer* (1729), his best performance. On Lawrence Eusden's death (1730) Savage worked hard to obtain the succession to the Laureateship, but though George II. agreed to the nomination, the post was given to Colley Cibber. However, Savage complied with official duties so far as to write a birthday poem (1732) in honour of Queen Caroline, who was so highly gratified that she bestowed on him a pension of £50 a year, and, notwithstanding Cibber's protests, Savage dubbed himself Volunteer Laureate. He supplied Alexander Pope with some materials for *The Dunciad*, but, quarrelling with Tyrconnel, the latter withdrew his protection and Savage was again an outcast. Still, he evidently produced a favourable impression on Dr. Johnson, who came to London in 1737. By the efforts of his friends a small annuity was raised for Savage on condition that he lived in Wales. Thither he went in 1739, but soon tired of his exile, and started on his return to London, when death overtook him on August 1st, 1743, at Bristol, where he had been imprisoned for debt.

Savannah, a seaport and city of Georgia, United States, on the right bank of the Savannah, 18 miles from its mouth on the Atlantic. A very large trade is done in the harbour—cotton, rice, timber, resin, and turpentine being the chief exports, whilst manufactured goods are imported in great quantities. Its principal industries comprise the making of fertilisers, flour, locomotives and railway stock, and cotton-seed oil. Owing to the many parks (of which Forsyth Park with its variegated and luxuriant sub-tropical vegetation is exceptionally beautiful) and shaded squares and streets within its boundaries, the town is popularly known as the Forest City. Amongst the public monuments are the Confederate

War Memorial on the Parade Ground, the Liberty Statue raised on the spot (now Monterey Square) where Count Casimir Pulaski fell in 1779 in the War of Independence, and those in memory of General Nathaniel Greene and Sargeant Jasper. The prominent public buildings include the court-house, city hall, Telfair Academy of Arts and Sciences, Telfair Hospital, Hodgson Hall (housing the archives and library of the Georgia Historical Society), and the Roman Catholic cathedral, besides several educational and charitable institutions. Georgia (named after George II.) was settled in 1733 by General James Oglethorpe and captured by the British in December, 1778. In the following year a combined force of Americans and French sustained a severe repulse, but the town was evacuated by the British in 1782. During the Civil War it sided with the Confederates, but General Sherman occupied it on December 21st, 1864. Pop. (1900), 54,244.

Savannah Blackbird (*Crotophaga ani*), a bird allied to the Cuckoo, from Southern and Central America. The total length is about 14 inches, the plumage bluish-black, glossed with violet. This bird, like other species of the genus, feeds on insects parasitic on cattle. They are said to nest in common, and to rear their young together.

Savary, ANNE JEAN MARIE RÉNÉ, DUC DE ROVIGO, soldier and diplomatist, was born at Marçq, in the department of Ardennes, France, on April 26th, 1774. He joined the French cavalry in 1790, and at the age of three-and-twenty became a major. He next served under Desaix in Egypt and at Marengo (1800). Napoleon entrusted to him the execution (if murder be too strong a term) of the Duc d'Enghien, and employed him in his negotiations with the Tsar (1805). In the Jena campaign of 1806 he showed great military ability, but his defeat of the Russians at Ostrolenka in Poland (1807) was his most splendid achievement. He was created Duke of Rovigo, and his diplomatic success at Madrid in 1807 was no less marked. In 1810 he succeeded Joseph Fouché, Duke of Otranto, as Minister of Police. After Napoleon's fall he wished to accompany him to St. Helena, but was imprisoned at Malta. He escaped and wandered for some years, reaching England in 1819. Making peace at last with the Bourbons, he was restored to his rank and dignities and resided in Rome till 1831, when he was entrusted with the chief command in Algeria. Though he performed his task creditably, his health gave way and he returned to Paris, where he died on June 2nd, 1833.

Save (Hungarian, *Scava*; Latin, *Savus*), a river of Austria-Hungary, and one of the chief tributaries of the Danube. It rises in the mountainous country in the extreme north-west of Carniola, flows south-eastwards through Croatia, gradually pursues a more easterly

direction, while it serves as the boundary between Bosnia and Slavonia and between Serbia and Slavonia, ultimately falling into the Danube at Belgrade, after a course of 500 miles. On the left it receives the Lonja and numerous small streams, but on the right its affluents are more important and include the Laibach, Kulpa, Unna, Vrbas, Bosna, and Drina. The chief town on its banks is Agram (or Zagrab). It is navigable by steamers from its mouth to the confluence of the Kulpa.

Savigny, FRIEDRICH KARL VON, jurist, was born at Frankfort-on-Main, Germany, on February 21st, 1779, and was educated for the law at Marburg and Göttingen. In 1803 he brought out his treatise on the Right of Possession (*Das Recht des Besitzes*). After a brief sojourn as professor at Landshut he was called in 1810 to the chair of Roman Law in the newly-established university of Berlin, and was also employed practically in the administration of justice, in 1842 attaining the position of Grosskanzler. Among his great works are *Geschichte des Römischen Rechts im Mittelalter* ("A History of Roman Law in the Middle Ages"), *The Modern System of Roman Law, A Treatise on Obligations*, and several volumes of miscellaneous essays. He died at Berlin on October 25th, 1861.

Savile. [HALIFAX, MARQUIS OF.]

Savile, SIR HENRY, scholar, second son of Henry Savile, was born at Over Bradley, near Halifax, on November 30th, 1549. Educated at Brasenose College, Oxford, and at Merton College, of which he was elected Fellow in 1565, he graduated M.A. in 1570. After lecturing voluntarily in mathematics and being junior proctor in 1575 and 1576, he travelled on the Continent in 1578, collecting manuscripts and becoming acquainted with the most eminent men of the time. On his return he was made tutor in Greek to Queen Elizabeth, and in 1585 was elected warden of Merton College, which he ruled autocratically and prosperously until his death. In May, 1596, he became also provost of Eton College, where he likewise proved a severe disciplinarian, over preferring the plodding student to the wit. His scholarship recommended him to King James VI., by whom he was knighted in 1604. On the death of his only son in the same year, Savile devoted the bulk of his fortune to the advancement of learning and, in 1619, founded the chairs of geometry and astronomy which bear his name, as well as bestowing other benefactions on his university. He died at Eton on February 19th, 1622, and was buried in the College Chapel there "by torchlight to save expense, though he left £200—for his funeral." Spoken of as "the magazine of all learning," Savile was one of the greatest scholars of his day. He was one of the translators of the Authorised Version of the Bible; he was appointed to translate King James's *Apology for the Oath of Allegiance*, and, in

addition to many other works, his long contemplated edition of *St. Chrysostom* (8 vols., 1610-13), the printing of which he himself superintended, was the first learned work on a great scale published in England.

Savin (*Juniperus Sabina*), a tree or shrub, native to Southern Europe, the young green shoots of which yield an oil resembling turpentine. The preparations of this drug are sometimes employed to produce counter-irritation, and in the treatment of diseases of the pelvic organs.

Savings Banks, which were intended to do for the poor what ordinary banks do for the rich, were proposed by Daniel Defoe in the 17th century; but, though France and other European countries adopted them in the middle of the 18th century, it was left for the Rev. Joseph Smith, rector of Wendover, in Buckinghamshire, to initiate the movement in England in 1799. This example was followed in Scotland by the Rev. John Mackay, of West Calder, in 1807, and the Rev. Dr. Henry Duncan, of Ruthwell, in Dumfriesshire. The original savings banks were voluntary, and have been the subject of different Acts of Parliament, which have been consolidated and deal chiefly with the points of attendance of trustees, the comparison of pass-books with the bank-books, and the establishment of a good system of audit. Savings banks have been in a great degree superseded by the establishment of Post Office Savings Banks, first suggested by the Archdeacon of Northumberland in 1852, this suggestion having been carried into effect in 1861. The Post Office system of banking has been adopted in India, the Colonies, and many European countries. The Post Office opens accounts with Friendly, Charitable, Provident and Trade Societies, and also receives accounts opened by Registrars of County Courts under the provisions of the Workmen's Compensation Acts and the County Courts Acts. It offers facilities to the managers of elementary schools for the encouragement of thrift amongst boys and girls by the saving of small sums on the stamp deposit system. The purchase of Government stock is another branch of its activity, while it grants immediate and deferred annuities and transacts life insurance business.

Savoie, a department of South-Eastern France, bounded on the N. by Haute-Savoie, on the E. and S.E. by Piedmont (Italy), on the S. by Hautes-Alpes, and on the W. by Isère and Ain. It occupies an area of 2,386 square miles. The surface is almost wholly composed of mountain masses and intervening valleys, the highest point being in the Massif de Vanoise, 12,668 feet above the sea. The principal rivers are the Isère and its affluent the Arc, the Rhône being a natural boundary on the west. The Lac de Bourget discharges into the Rhône by a canal. Agriculture is the leading industry, the chief crops being wheat, rye, barley,

maize, oats, potatoes, pulse, chestnuts, beet-root, tobacco, hemp and grapes. Dairying flourishes, butter, milk, cheese and honey being extensively produced, while some classes of live-stock are raised on a large scale. Though disafforestation has been carried out to a culpable extent, forests of chestnut, walnut, elm, oak, ash and pine yet occur in many parts. The minerals comprise iron, lead, copper, coal, zinc, antimony, arsenic, manganese, sulphur and asbestos, besides slate, limestone and marble quarries. There are several famous mineral springs, such as those at Aix-les-Bains, Marlioz, Challes, Salins-Moutiers and Bridelès-Bains, which are sulphurous, alkaline, or saline. The silk manufacture is of first-rate importance, and there are, in addition, manufactures of woollens, linens, paper, leather, bricks and flour, besides iron-foundries and engineering works. The department was constituted in 1860 out of the districts of Upper Savoy, Savoy proper, Tarentaise and Maurienne, which then formed the southern region of the province of Savoy in the kingdom of Sardinia. Chambéry (22,000) is the capital. Pop. (1901), 254,781.

Savoie, HAUTE, a department of South-Eastern France, bounded on the N. by the Lake of Geneva, on the E. by the Swiss canton of Valais, on the S.E. by Aosta (Italy), on the S. by Savoie, and on the W. by Ain. It covers an area of 1,774 square miles. It is almost exclusively mountainous and, on its south-eastern frontier, contains the summit of Mont Blanc (15,780 feet high). The chief rivers are the Arve, running from Mont Blanc to Geneva; the Drance, rising near the centre of the eastern boundary and flowing northwards to the Lake of Geneva; the Usse and Fier, tributaries of the Rhône, and the Arly, an affluent of the Isère. The Lake of Annecy is the largest sheet of water. The principal crops are wheat, rye, maize, barley, oats, potatoes, pulse, chestnuts, tobacco and grapes. Live-stock is raised on the hill pastures, and exports of dairy products include cheese, butter and honey. The forests comprise chestnut, walnut, pine, fir, larch, beech, elm, ash and hazel, but clearances have been ruthlessly effected in many districts. The mineral wealth includes lead, copper, iron, manganese and coal, and jasper, marble, slate, freestone and limestone are quarried. The best-known mineral springs are those of Evian-les-Bains, Amphion, St. Gervais, Menthon and La Caille, mostly sulphurous and chalybeate. There are manufactures of cotton, silk, woollens, iron, leather, paper, tiles and flour. The department was created in 1860 out of the old provinces of Genevois, Chablais and Faucigny, which then composed the northern half of the duchy of Savoy in the kingdom of Sardinia. Annecy (13,611) is the capital. Pop. (1901), 263,803.

Savona (classical *Savæ*), a city and port in the province of Genoa, Italy, on the Riviera, 25 miles S.W. of Genoa. Possessed of a good

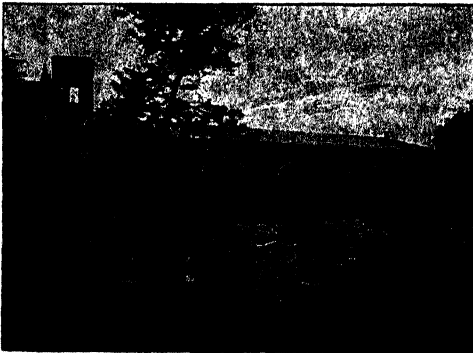
modern harbour, it does an increasing trade. Coal is imported extensively, the exports being chiefly fruits and local produce. Earthenware is the principal industry, but there are large ironworks, engineering shops and glassworks, and shipbuilding employs many hands. Among the public buildings may be noticed the commanding castle of St. George, the late Renaissance cathedral, the Della Rovere palace, now accommodating the prefecture and other Government offices, the town-house, episcopal palace and Teatro Chiabrera, founded in honour of the lyric poet Gabriele Chiabrera, who was born and died in Savona (1552-1637). The ancestors of Christopher Columbus were Savonese. Pop. (estimated), 29,000.

Savonarola, GIROLAMO, reformer, was born at Ferrara, Italy, on September 21st, 1452, and in 1474 entered a Dominican monastery at Bologna, where his fervent zeal won him profound respect. In 1482 he was sent to Florence, then under the brilliant but licentious sway of Lorenzo the Magnificent. His preaching at first attracted little notice, but at Brescia in 1486 his eloquent denunciations of prevailing vice and threats of wrath to come struck terror into his hearers. In 1490 he returned to Florence, and his first "terrible sermon," as he called it, in St. Mark's gave him such a hold over the population that Lorenzo began to feel uneasy. Savonarola rejected his overtures with scorn, predicting his speedy death and also that of the Pope (Innocent VIII.) and the King of Naples. As regards the first two his prophecies were fulfilled next year, and in 1494 Charles VIII. of France entered Florence, and swept away the Medicean dynasty. For three years the Dominican prior was virtually dictator, and a strange puritanic reaction came over the city of pleasure, culminating, in 1497, in the famous "bonfire of the vanities"; but Alexander Borgia, the new Pope, combined with the Franciscans and the Arrabbiati and Medicean parties to overthrow the reformer, and the Piagnoni faction, which supported Savonarola, lost their supremacy. After endless intrigues Savonarola was ejected from his church and imprisoned with two of his faithful companions, Fra Domenico and Fra Silvestro, the three martyrs being at last hanged and then burned in Florence on May 23rd, 1498. He left many writings, but *The Triumph of the Cross* is the only work of high importance. He never abjured the Catholic Church.

Savory, two species of the labiate genus *Satureja*, *S. hortensis* (summer savory) and *S. montana* (winter savory), both natives of Southern Europe. They have been cultivated from ancient times as sweet herbs, and were introduced into England in 1562. Virgil recommends them for planting near bee-hives, and they were used in vinegar, serving a similar purpose to mint sauce. The summer species is annual, the winter evergreen and shrubby, and both are closely allied to thyme.

Savoy, or SAVOIE, a district in the south-east of France, formerly a province of Sardinia, now comprised in the departments of Haute-Savoie and Savoie, bounded on the N. by the Lake of Geneva, on the E. by the Valais, on the S.E. by Piedmont, on the S. by the Hautes-Alpes and Isère, and on the W. by the Rhône. Forming in Roman times the provinces of the Graian and Pennine Alps, this tract of country acquired in the 4th century after Christ the name of Sapaudia, whence its present designation. Conquered by Charlemagne, it passed to the Emperor Conrad, who gave it as a county to Humbert the Whitehanded, founder of the House of Savoy. It was erected with Piedmont into a duchy in 1416 under Amadeus VIII., whose dominions extended to Nice on the sea and to the Sesia in Italy. In 1720 Victor Amadeus II., obtaining the throne of Sicily, exchanged it for that of Sardinia, and thus became the first king. His successors headed the Italians in their resistance to Napoleon, and in 1848 Charles Albert took up the cause of the nation against Austria, was defeated at Custoza and Novara, and resigned in favour of his son Victor Emmanuel II., under whom Italy was united, but at the cost of Savoy, which was ceded to France as the price of her aid in 1860, remaining, however, exempt from French taxation. It occupies an area of 4,162 square miles. Pop. (1901), 518,584.

Savoy Precinct, a parish in Westminster, 1 mile W. by S. of St. Paul's Cathedral. Here



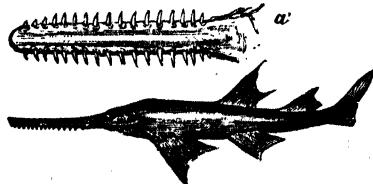
SAVOY: CHAPEL ROYAL.

stood the Savoy Palace, a great battlemented edifice abutting on the Thames, built by Simon de Montfort, in 1245, and afterwards given to Peter, Earl of Savoy and Richmond, uncle of Eleanor of Provence, queen of Henry III. It took its name from the latter owner. John, King of France, was confined in it after the battle of Poitiers in 1356, and then it became the town house of John of Gaunt and was almost wholly demolished during the rising led by Wat Tyler in 1381. After it had been rebuilt Henry VII. transformed it into

a Hospital of St. John the Baptist in 1505. Ten years later the Chapel Royal, in the Late Perpendicular style, was erected. Though the hospital was suppressed in 1553, it was revived by Mary and retained its royal endowment till it was abolished in 1702. Within its walls was held the Savoy Conference for the revision of the Litany in 1681. During the construction of the northern extremity of Waterloo Bridge and its approach the last vestiges of the Palace were removed. The Chapel Royal suffered serious damage from fire in 1864, but was restored at the cost of Queen Victoria, the Chapel belonging to the Crown as an appanage of the Duchy of Lancaster. Gavin Douglas, Bishop of Dunkeld and translator of the *Aeneid*, and George Wither, the poet, were buried in the Chapel, the former in 1522, the latter in 1667. A small part of the Thames Embankment and Gardens, and the Savoy Theatre and Hotel occupy the site of the Savoy Palace.

Sawdust is composed of the small particles of matter which are produced in the act of sawing, but the word is used in a narrower sense generally to denote the dust produced by sawing wood. This dust is used in many industries, as, for example, for the manufacture of oxalic acid, for polishing by jewellers, for the making of bois-durci (or tough wood, the dust of ebony, rosewood and other hard woods made into a paste and pressed into moulds and employed for the making of high-class ornaments), for packing by furriers and perfumers; and the coarser kind, such as comes from the old-fashioned handsaw, is of great use for packing ice. Grapes and other fruit are also packed in sawdust, and its use on a wet wicket in the cricket field, to afford a firmer footing for the bowler, is familiar to every follower of that noble game, while "brandy" has been made from grape-sugar derived from sawdust.

Sawfish, a fish belonging to the genus *Pristis*, with five species from tropical and sub-tropical seas. They belong to the same group as the Rays, and have the snout produced into a flat blade-like form (sometimes six feet long and a foot broad at the base), and armed at



SAWFISH AND SAW (a.).

the side with projecting teeth. The true teeth are small; but with its "saw" the fish tears off flesh from its prey (often large cetaceans), or rips open the abdomen and devours the soft parts. The skin is used for polishing.

Saw Fly an insect belonging to the Tenthredinidæ family of the Phytophaga, or leaf-eating tribe, of the order Hymenoptera. Their popular name refers to the peculiar shape of the ovipositor. Instead of being a boring instrument consisting of an upper channelled piece and two slender pieces closing the channel below, this is a saw-like blade occupying the apical cleft of the abdomen and composed of two lateral pieces only. By means of their ovipositors the females cut slits in the leaves or tender shoots of trees and plants; the two plates are then separated a little, so as to widen the hole already pierced, and an egg passes down, the irritation causing a flow of sap to the wound. When fully grown the larvæ hatched from the eggs spin a cocoon, attached to leaves or twigs on which the larvæ have fed, or placed underground. As the time for the emergence of the perfect insect approaches, the change to the pupa state is soon effected and from this the imago is speedily produced. The species exceed a thousand in number, some being found in Great Britain. *Lyda pratensis*, black with yellow markings, and *Lyda campestris*, blue-black, affect pines and firs; *Lyda betulæ*, reddish-yellow, feeds on the birch; *Lophyrus pini*, the male black with yellow legs, and the female yellow with black head, occur on conifers; *Nematus ventricosus*, reddish-yellow, haunts gooseberry and currant bushes; *Athaliæ spinarum*, reddish-yellow, plays havoc with turnips; *Hylotoma rosarum* attacks rose trees; *Tenthredo æthiops*, black, favours fruit trees, with a preference for the cherry; and *Nematus saliceti* is met with on willows, on which, like others of the family, it produces galls. They are mostly small—from a quarter to half an inch long—and are frequently veritable pests both in field and forest.

Saxe, HERMANN MAURICE, COMTE DE, marshal of France, natural son of Augustus II. of Saxony and Poland by the Countess von Königsmarck, was born at Goslar in Hanover, on October 28th, 1696. Soldiering was in his blood and at the age of twelve he escaped from the tutelage of his mother and was wounded at the siege of Tournai in 1708. In 1717 he raised the siege of Belgrade. Going to France after the Peace of Utrecht, he accepted in 1726 the duchy of Courland. In spite of a valiant struggle he had to resign his acquisition and return to Paris. In 1734, his father being dead, he entered the French service under Marshal Berwick, and covered himself with glory at Philippsburg. Obtaining command of a division in the War of the Austrian Succession, he took Prague (1741) and Eger (1742), was made a marshal of France, and entrusted with the charge of the army of Flanders. He won the battles of Fontenoy (1745), Raucoux (1746), and Laufeldt (1747), and took Brussels, Antwerp, Namur, Maestricht, and other fortresses. He died in the château of Chambord on November 30th, 1750.

Saxe-Altenburg, a duchy of Thuringia, Germany, comprising two nearly equal territories separated by Reuss the Younger. It covers an area of 511 square miles. The eastern or Altenburg portion contains some of the offshoots of the Erzgebirge and is watered by the Pleisse and other streams. The surface of the western or Eisenberg section is also hilly, and the Saale and Roda are the chief streams. Agriculture is well developed, the principal crops being rye, oats, barley, wheat and potatoes. Live-stock is raised in considerable numbers. The manufactures are varied, though none is of first-rate importance. The farmers and peasants of the eastern division have the name of being avaricious and purse-proud and are wealthier than in any other part of the Fatherland, and the custom amongst them is that the youngest son inherits the father's landed property. The duchy sends one member to the Bundesrat and one to the Reichstag. Altenburg (37,110) is the capital. Pop. (1900), 194,914, nearly all Protestant.

Saxe-Coburg-Gotha, a duchy of Thuringia, Germany, consisting of the duchy of Coburg (bounded on the N.N.E. and N.W. by Saxe-Meiningen and on the other sides by Bavaria) and the duchy of Gotha (bounded on the N. and N.E. by Prussian Saxony, on the W. by Saxe-Weimar-Eisenach, on the S.W. by Saxe-Meiningen, on the S. by Hesse-Nassau and Prussian Saxony, and S.E. by Schwarzburg-Sondershausen). It covers an area of 755 square miles. Coburg is traversed by the southern heights of the Thuringian Forest (highest point 1,716 feet), and watered by affluents of the Main. The highest point in Gotha, which is more than twice as large as Coburg and extends along the northern slopes of the Thuringian Forest, is the Grosse Beerberg (3,225 feet), and the streams include the Gera, Neisse and Hörzel. Agriculture is the predominant industry, the leading crops being oats, barley, rye, wheat and potatoes. Live-stock raising is important, but the mineral resources are poor. The manufactures include textiles, iron goods, machinery, glass, earthenware, chemicals, meerschäum pipes and toys. The productions of the Geographical Institute of Perthes in Gotha are of world-wide fame. The duchy sends one member to the Bundesrat and two members to the Reichstag. On the death of Duke Ernest II., childless, in 1893, the succession passed to the Duke of Edinburgh, and, at his death in 1900, to his nephew, the Duke of Albany (b. 1884). Gotha (34,651) and Coburg (20,460) are the capitals. Pop. (1900), 229,550, almost entirely Protestant.

Saxe-Meiningen, a duchy of Thuringia, Germany, bounded on the N.W. by Saxe-Weimar-Eisenach, on the N. by Gotha, Hesse-Nassau, Schwarzburg-Sondershausen, Schwarzburg-Rudolstadt, and on the E. by Saxe-Eisenberg, Neustadt, Prussian Saxony, and Schwarzburg-Rudolstadt, and on the S. by Bavaria. It

covers an area of 953 square miles. The highest point of its surface, which is mainly hilly, is Gebaberg (2,464 feet) of the Thuringian Forest highlands, and the rivers are the Werra and affluents of the Saale. The chief crops are rye, oats, wheat, barley, potatoes, tobacco, hops and flax. Fruit is somewhat extensively cultivated in certain valleys, and live-stock is raised on a minor scale. Iron, coal, salt and slate are the principal minerals, while the waters of Friedrichshall are in high repute. The manufactures comprise iron goods, glass, pottery, school-slates, toys and textiles. The duchy sends one member to the Bundesrat and two members to the Reichstag. Meiningen (14,518) is the capital. The duchy is noted for the company of actors of surpassing excellence which it maintains. Pop. (1900), 250,731, predominantly Protestant.

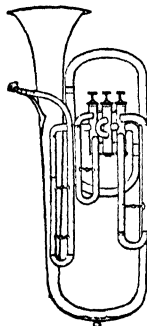
Saxe-Weimar-Eisenach, a duchy of Thuringia, Germany, comprising—in addition to 24 small detached portions—three principal divisions, the central (containing the towns of Weimar, Jena and Apolda), separated from the western (containing Eisenach) by Prussian Saxony and Gotha, and from the eastern (containing Neustadt) by Saxe-Eisenberg. It covers an area of 1,388 square miles. The highest point of Weimar is the Kichelhahn (2,825 feet) in Ilmenau, and among its streams are the Saale and Ilm. In Eisenach, the most beautiful of the divisions, the highest point is Elnbogen (2,677 feet), a peak of the Rhön system, while the Werra, Hösels and Ulster are the chief rivers. The highest point of Neustadt is the Kesselberg (1,310 feet), and the main streams are the White Elster, Weida and Orla. The chief crops are oats, rye, wheat, barley, potatoes, beetroot, flax and oil-seeds. Live-stock raising is a flourishing branch of agriculture. Fruit is grown largely in certain districts. Iron, copper, cobalt, lignite and salt are the minerals, which are of comparatively small importance. Apolda has been called the "Manchester of Weimar." Jena is famous for its university, Eisenach is inseparably connected with the life-history of Martin Luther, and Weimar has acquired immortality through its associations with the illustrious Goethe, Schiller, Herder and other brilliant intellects. The manufactures comprise all kinds of textiles, earthenware, crockery, microscopes, scientific instruments, pipes, leather, paper, glass and beer. The duchy sends one member to the Bundesrat



GOTHA.

and three members to the Reichstag. Weimar (28,489) is the capital. Pop. (1900), 362,873, the vast majority being Protestant.

Saxhorn, a brass wind-instrument, invented by Antoine Joseph Sax, who is commonly designated Adolphe (1814-94), at Paris about the year 1845. The instrument has a bell mouth turned upward and a cupped mouthpiece, and is fitted with valves for modifying the tones. The saxhorn exists in several voices, the tenor being that which is most in use. Though very little used for orchestral music, the saxhorn is generally employed in military bands.



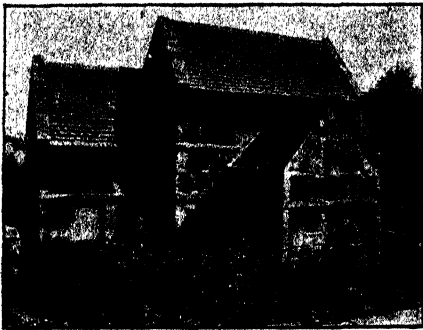
SAXHORN.

Saxifrage (*Saxifraga*), a genus of calycifloral Dicotyledons, the type of the order Saxifragaceae, comprising nearly 200 species, belonging to the temperate and arctic-alpine floras of the northern hemisphere. They are mostly dwarf perennial herbs, with tufted simple exstipulate leaves, and white, yellow, or pink flowers, with five petals, ten stamens, and two half-superior and half-united carpels. Certain kinds, like the gooseberry and currant, are universally esteemed for their fruits. Of some twelve British species, *S. umbrosa*, London Pride, None So Pretty, or St. Patrick's Cabbage, has fleshy leaves with notched margins, *S. granulata* bears numerous small tubers, *S. tridactylites* is viscid with glandular hairs and reddish tri-lobed leaves, and *S. hypnoides*, the mossy saxifrage, with much-divided foliage, forms tufts on the higher

mountains. Many others are in cultivation, especially in rock-gardens. One section (*Megasea*) has large fleshy leaves and large clusters of rose-pink flowers. The name refers to many of the species growing in crevices of bare rock, as if breaking it.

Saxo Grammaticus belonged to a warrior family of Denmark, and was born in Zealand about the latter half of the 12th century. He became secretary to Archbishop Absalon about 1180, and at his instigation began to compile a chronicle of Danish kings. This, the *Gesta Danorum*, was completed in 1208, and was held in high esteem during the Middle Ages. He wrote a brilliant but affected style. His work was the outcome of his patriotism, as he did not like to see Denmark continuing infertile in letters, whilst other nations contributed to the sum total of human knowledge. His history is therefore of exceptional value to Danish annalists, since but for Saxo's laudable ambition all manner of traditions, folklore and sagas would probably have perished. The legendary, however, must be sifted from the authentic and he naturally becomes more trustworthy the nearer he approaches to his own day.

Saxon Architecture is a rude variety of the Romanesque. From the fact that the Saxons employed chiefly wood for building purposes, not much of their architecture has come down to us; but the churches of Bradford-on-Avon, in Wiltshire, and Barnack and Earle Barton, in



SAXON ARCHITECTURE: BRADFORD-ON-AVON CHURCH.

(Photo: Williamson, Troubridge.)

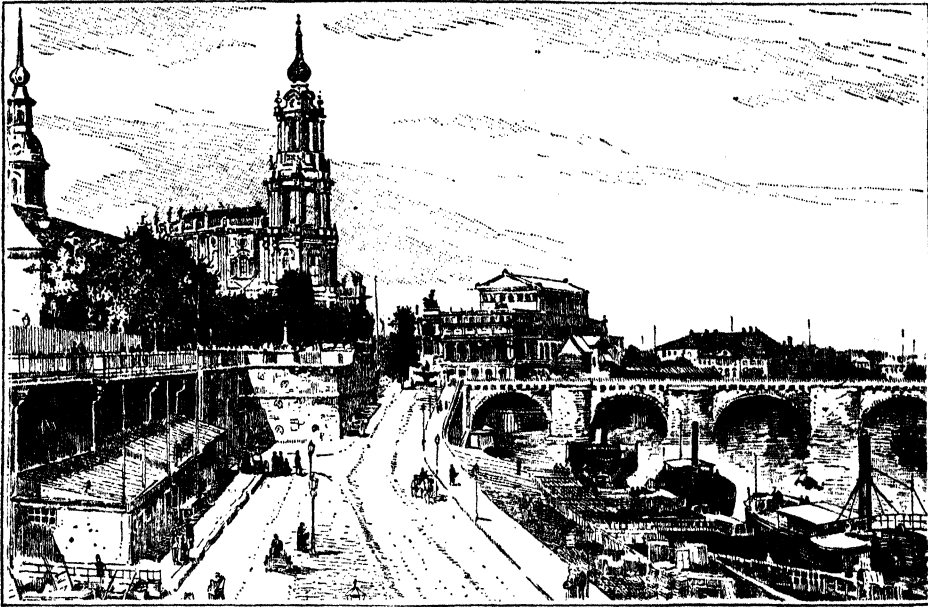
Northamptonshire, afford excellent examples of it, the first-named particularly. It was rough and massive, characterised by the alternate vertical and horizontal position of the quoins, and sometimes ornamented on the outside by fillets. The windows were splayed both from within and without.

Saxony (Latin, *Saxonia*; German, *Sachsen*). The kingdom of Saxony, Germany, has an area of 5,787 square miles, forming an irregular triangle with its base along the Erzgebirge

range, which separates it from Bohemia, and its apex at Leipzig. It is bounded on the N.W., N. and N.E. by Prussia, on the S.E. and S. by Bohemia, on the S.W. by Bavaria, and on the W. by the states of Thuringia. Except in the south, where there are elevations of 4,000 feet, the surface is hilly, merging towards the north into the great central plateau of Europe. In the south-east, on both sides of the Elbe and extending into Bohemia, is the tract known as Saxon Switzerland, so named from the picturesque appearance presented by the fantastic peaks of weathered sandstone, rising sometimes to a height of 1,800 feet. The soil is exceedingly fertile, yielding heavy crops of rye, oats, and other cereals, beetroot, potatoes, flax, and fruit. A small quantity of wine is produced. Coal is found in some abundance near Dresden and at Zwickau (64,349). Silver, silver-lead, tin, iron, cobalt, copper, zinc, and bismuth are profitably worked, and there is a good supply of building-stone, porcelain-clay, and brick-earth. Textile industries of cotton, wool, and flax flourish. Dresden (480,658) and Meissen (31,434) are the seats of large china and pottery works. The iron-smelting and machine-making at Freiberg (30,175) and Chemnitz (214,030) employ many hands, and Leipzig (456,124) is the centre of the printing trade of Germany. Lace-making and straw-plaiting are carried on in the rural districts. The Elbe is the chief river and, with its affluents, drains the whole country, except the small portion which sends its waters through the Neisse into the Oder. Dresden is the capital. Saxony is represented in the Bundesrat by four members, and in the Reichstag by twenty-three. It was not till 1423 that Frederick, Margrave of Meissen and Landgrave of Thuringia, was recognised as Elector of Saxony. His grandsons, Ernest and Albert, divided their territories, the former taking Thuringia as well as Wittenberg, whilst Meissen and East Saxony fell to Albert. The Albertine line ultimately secured most of the land and the Electoral dignity on the defeat of John Frederick, the last Ernestine Elector, at Muhlberg by Charles V. (1547). At the Peace of Westphalia (1648) the Elector, John George, deserted his principles, and the prestige of the duchy declined, whilst portions were alienated in favour of younger sons. Frederick Augustus I. and his son added the kingdom of Poland to their ducal titles, but their reigns were disastrous to their subjects. Under Frederick Augustus (1763-1827) the duchy became a kingdom, but in 1815 more than half the territory was handed over to Prussia. A long struggle for constitutional liberty now ensued, marked by concessions in 1831 and reactionary measures after 1848. In 1866 Saxony aided Austria against Prussia, and was compelled to pay an indemnity, join the Northern Confederation, and abandon its independent political relations with other Powers. In 1870 Saxony fought on the side of Prussia against France under the

leadership of King Johann (d. 1873), and is now regarded as a loyal member of the Empire. Pop. (1900), 4,202,216, of whom the enormous majority are Protestant.

valves, modulating the tone by means of twenty holes. Like its relative the saxhorn, it is of very considerable importance in military music, but is not much used in the orchestra.



LANDING-PLACE, DRESDEN, SAXONY.

Saxony, PRUSSIAN, a province of Prussia, Germany, bounded on the N.E. and E. by Brandenburg, on the S. by Saxony and the Thuringian States, on the W. by Hesse-Nassau and Brunswick, and on the N.W. by Hanover. It covers an area of 9,751 square miles. The surface is very varied. In the west are the Harz Mountains and in the south the hills of the great forest of Thuringia. It is drained by the Elbe and its affluents the Black Elster, Mulde and Saale. It is one of the most fertile regions in Germany. The principal crops are cereals, potatoes, beetroot, fruit, grapes, hops and vegetables, and the raising of live-stock flourishes in almost every quarter. The coal-field is the most extensive in the Fatherland, but in other respects the minerals are restricted, the chief being iron, salt and kainite. Magdeburg (229,663) is the capital. Pop. (1900), 2,832,616.



SAXOPHONE.

Saxophone, another of the horns invented by Adolphe Sax. It consists of a conical brass tube, having a single reed as mouth-piece, and fitted with finger-

Say, JEAN BAPTISTE, political economist, was born at Lyons, France, on January 5th, 1767, of Protestant parents. He was educated in England for a business career, but returned to France as secretary to Clavière, afterwards minister of finance, who directed his mind to the study of Adam Smith's *Wealth of Nations*, and so introduced him to political economy. During the Revolutionary period he was an active journalist and politician. In 1800 he published *Olbic*, an essay on reform, and in 1803 his *Traité d'Economie Politique*. Under the Empire he devoted his energies to the cotton trade, but after the peace became professor, first at the Conservatoire des Arts et Métiers (1819) and later at the Collège de France (1831). His *Lettres à Malthus* and *Cours Complet d'Economie Politique pratique* appeared in his later years. He died in Paris on November 16th, 1832. His grandson, the well-known French politician, M. Léon Say, was born in 1826 and died in 1896.

Sayce, ARCHIBALD HENRY, Assyriologist, was born at Shirehampton, Gloucestershire, England, on September 25th, 1846, and educated at Grosvenor College, Bath, and Queen's College, Oxford. For several years he was a tutor in Oxford, and from 1876 to 1890 officiated

as deputy-professor to Max Müller in the chair of Comparative Philology. From 1874 to 1884 he was a member of the Old Testament Revision Company, on which his knowledge of Oriental archæology was of exceptional value, and since 1891 has filled the chair of Assyriology at Oxford. Among his numerous works, testifying alike to his erudition and industry, may be mentioned *The Principles of Comparative Philology* (1874), *Babylonian Literature* (1877), *Introduction to the Science of Language* (1879), *The Ancient Empires of the East* (1884), and *The Higher Criticism and the Verdict of the Monuments* (1894), in addition to commentaries on several books of the Bible, Assyrian grammars, and editions of various secular authors from Herodotus downwards, besides Murray's *Handbook to Egypt*. He delivered the Hibbert Lectures (*Babylonian Religion*) in 1887, and the Gifford Lectures in 1900-2, and is LL.D. of Dublin (1881) and D.D. of Edinburgh (1889).

Sayers, TOM, prize-fighter, was born at Brighton, Sussex, England, on May 25th, 1826. His father was a shoemaker, but Tom became a bricklayer on the Brighton and Lewes, and, in 1848, on the London and North-Western Railway. His pugilistic career opened with the defeat of Crouch at Greenhithe in 1849, but four years later he suffered his only defeat, at the hands of Nat Langham at Lakenheath. He won the champion's belt in 1857 by beating Bill Perry at the Isle of Grain. His last and most celebrated contest was that with John C. Heenan ("the Benicia Boy") at Farnborough on April 17th, 1860, which lasted 37 rounds and occupied two hours and six minutes. The finish was declared a draw, but the opinion was freely expressed at the time that had the referee been competent and Heenan fought fairly the result would have been a win for the Englishman. Sayers retired from the championship in 1860, and a testimonial, amounting to £3,000, was raised by public subscription, the interest being paid on condition that he gave up fighting. He died in London on November 8th, 1865.

Scab, the name applied to a parasitic disease in sheep. It is caused by insects of the Acaridæ family, of the order Acarina, of the class Arachnida, certain genera of which, such as *Sarcoptes*, are veritable pests. They burrow in the skin and give rise to intolerable irritation. To relieve the nuisance the sheep rub themselves against posts, hurdles, and walls, and in this way sound sheep are readily infected. Some of the solutions used for sheep-dipping are efficacious, and one of the simplest and best is a poisonous "brew" of common salt and Irish twist tobacco (to 1 lb. of each, boiled in ½-gallon of water, add 2 drachms of corrosive sublimate and dilute the whole to a capacity of 3 gallons). One pint should be thoroughly applied to the scabby parts of every sheep and the dressing repeated in a week. This should suffice.

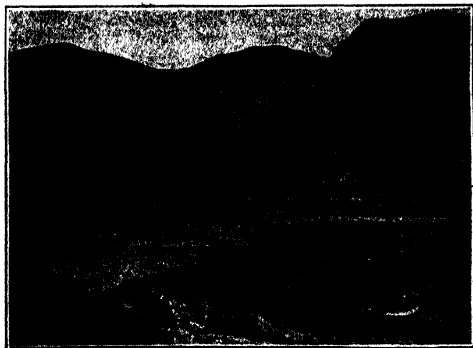
Scabies. [ITCH.]

Scabious (*Scabiosa*), a considerable genus of perennial herbs belonging to the Teasel family (Dipsacæ), and named from their former use in skin disease. There are three British species, the blue-purple and lilac capitula of which, distinguished from all Compositæ by the four free anthers of each floret, are familiar on every heath and in every corn-field. The abruptly "premorse" rhizome gives one species (*S. succisa*) the popular name of Devil's-bit, the legend being that the tip of the root was a cure for all diseases, and was therefore bitten off by the Evil One out of envy of the human race. A species (*S. atropurpurea*) common in gardens, with dark chocolate-black flowers with white stamens, is known as "mournful widow."

Scad (*Caranx trachurus*), the Horse Mackerel.

Scævola ("left-handed," so called in honourable allusion to the loss of his right), the surname given to Mucius Cœlius Codrus, a Roman warrior who, when Porsena invaded Rome in 507 B.C., entered the Tuscan camp in order to stab the king. He was seized and dragged before his intended victim, whereupon he thrust his right hand, which had failed of its aim, into the altar fire, and held it there till it was consumed, telling the invader that three hundred comrades as resolute as himself had sworn to take his life. Porsena released him and made peace with Rome.

Scafell, or SCAW FELL, the highest mountain in England, stands at the head of Eskdale in Cumberland, close to the border of Westmoreland, and 11 miles south-west of Keswick.



SCAFELL.

There are two peaks, Scafell Pike (3,210 feet) and Scafell (3,162 feet), which are divided by Mickledore Chasm. Like the rest of the system, they are composed geologically of a granite base capped by crystalline schists and quartzitic grits. Scafell Pike is usually ascended from Wasdale (the easiest and shortest route), Dungeon Gill, Rosthyaité, or Boot in Eskdale,

and commands fine views not only of the surrounding lakes, but also of Scotland, the Solway, and the Isle of Man. Scaffell is most easily ascended from Wasdale Head, either directly or by Esk House. There is, therefore, no occasion for climbers to be foolhardy and select routes like the Chimney and others, which may lead to serious difficulty and danger and have even involved fatal accidents.

Scagliola, a composition, originally of Italian invention (as suggested by the name), employed in ornamental art for the purpose of imitating stone, being a cheap means of securing the effect of costlier substances. The material is composed of plaster of Paris and glue, receives bits of stucco or stone, according to the imitation desired, and may be coloured by metallic oxides. Granite can be imitated by employing small crystals. Sometimes as many as twenty coats are put on before the surface is finally polished. It is only adapted for interior decoration, since it is readily affected by weather.

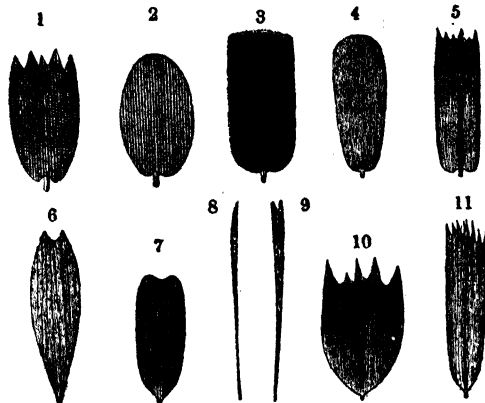
Scala Santa. Under the portico on the north side of the celebrated basilica of St. John Lateran, in Rome, is the Scala Santa, or Holy Stairs, which escaped all damage when the Lateran Palace was destroyed by fire. The staircase, which is constructed of marble and consists of 28 steps, is traditionally believed to have formed the approach to Pontius Pilate's house in Jerusalem and was therefore the actual stairs which Jesus descended when He left the prætorium. The Scala must only be climbed by penitents on their knees, and such has been the resort of the devotees that the stairs are stated to have been protected by wooden planks already thrice renewed. The scenes in Holy Week sometimes testify to an enormous degree of excitement and enthusiasm that beggars description. At the head of the staircase, the Sancta Sanctorum ("The Holy of Holies"), a small Gothic chapel, once the private chapel of the Popes and the sole remnant of their ancient palace, contains a portrait of Jesus at the age of 12, attributed to St. Luke, and asserted by tradition to be a faithful likeness. On each side of the Scala Santa is a wooden flight of stairs by which the penitents descend.

Scalds. [BURNS.]

Scale in music denotes the gradation of sounds passed through between a note and its octave. In some parts of the world a pentatonic scale prevails—e.g., in Chinese and ancient Celtic music—while the tetrachord and hexachord have had their admirers; but the modern European scales are octave, and are divided to diatonic, of which there are 12 major and 12 minor, and chromatic, in which the subdivision is much more minute. Some races take shades of tone too minute to be distinguished by a European ear.

Scales, horny modifications of the skin in reptiles, on the legs of birds, and in some

mammals. The scales of fishes are developed in grooves or pockets of the skin, as are the hair and feathers of higher animals. In the Sharks and Rays scales are replaced by "skin-teeth," consisting of a horny base covered with enamel. In the perfect state, a butterfly or



SCALES OF DIFFERENT GENERA OF LEPIDOPTERA.

1, 2.—*Papilio machaon*. 3, 4.—*Morpho menelaus*. 5.—*Pamphilis arcanthusa*. 6.—*Scala aliformis*. 7.—*Zygena allipendula*. 8, 9, 10.—*Sphinx ligustri*. 11.—*Pierisporus pentadactylus*.

moth has four wings covered with scales. These scales resemble a fine dust, which rubs off easily, but if the wing be placed under the microscope it will be seen to be covered with a great number of elegantly-formed scales, immensely varied in shape. They are laid over each other like the tiles on a roof (imbricated) and are fastened to the wing by an infinitesimal stalk which, in some species, such as *Morphina*, appears to be fixed on a principle analogous to the ball and socket joint. The scales consist of a double membrane, finely striated. Between the striae, and parallel with them, are arranged pigment cells, though according to W. F. Kirby, this is not the sole cause of their beautiful colours, for the edges of the scales frequently refract the light and thus produce the most brilliant metallic lustre. If the scales be rubbed off a colourless membrane will remain with branching nervures, or air-tubes, running through it. In this condition it does not differ materially from the transparent wings of other insects, excepting for the sockets from which the scales have been removed.

Scales, MATHEMATICAL. It is obviously impossible to draw a map upon paper which shall be the same size as the country indicated, and the same holds with regard to architectural plans, and the like. It is therefore usual to settle upon a convenient size for the map, and then reduce all the actual linear measurements in the same ratio, that ratio being so chosen that the whole can be fitted into the size of the map. The drawing is then said to be made to scale, and this is indicated by

stating the "representative fraction" or ratio which the scale bears to the original, for example, 1 : 63360, or by noting the equivalent fact that it is a scale of 1 inch to the mile. This scale would only need a foot-rule divided in the usual way into inches and convenient fractions, but a scale of, say, 1 inch to 25 miles could be constructed in the following way to show a distance of 50 miles. Since 25 miles is indicated by 1 inch, 50 miles will need 2 inches; draw, therefore, a line 2 inches



FIG. 1.

long and divide it into five parts, the points of division being numbered from 0 to 50, and each division representing 10 miles. One division is subdivided into ten parts representing single miles; this may be either the first division (from 0 to 10), or another 10-mile division drawn on the left of zero as shown in the accompanying diagram (Fig. 1).

A diagonal scale is an elegant method for obtaining small subdivisions. Suppose, for example, it were desired to measure to

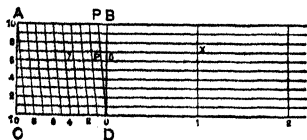


FIG. 2.

hundredths of an inch, the simple scale would show divisions to 10ths, and above this would be drawn 10 equidistant parallel horizontal lines, perpendicular lines crossing them at every inch. The line AB (Fig. 2) is divided into 10ths similarly to CD, a line is drawn from D to a point $\frac{1}{10}$ inch from B, other lines parallel to this being drawn through each division on CD. The distance x 7, therefore, is equal to 1.37 inches, for x 6 = 1 inch, and p 7 = .3 inch, while $6p$: BP = 6 : BC = 7 : 10 . $\therefore 6p$ = $\frac{7}{10} BP$ = .07 inch. It is to this principle of proportionality that the scale owes its value. A comparative scale is one connecting two different kinds of measurements. For instance, 30 Greek stadia might be represented by 5 inches, and a comparative scale of English miles would be thus found: 20 English miles would be a convenient length to take. Take 1 stadion = 1,094 yards \therefore 30 stadia = 32,820 yards and 20 English miles = 35,200. Then, as 32,820 yards are represented by 5 inches, 35,200 will be shown by 5.36 inches, and this latter line can be divided in the usual way. So, by measuring with compasses any length on the first, we get a number of stadia, and transferring the compasses to the second gives the equivalent number of miles.

Scales of Notation. We are accustomed to express any number in terms of multiples of ten and its powers; for instance—

$7234 = 4 + (3 \times 10) + (2 \times 10^2) + (7 \times 10^3)$. Here 10 is said to be the radix of the scale, which is known as the decimal scale or system. The radix might, however, be any other num-

ber, e.g., the number 7234 might be expressed as 30042, the radix being 7: for $4 + 3 \times 10 + 2 \times 10^2 + 7 \times 10^3 = 2 + 4 \times 7 + 0 \times 7^2 + 0 \times 7^3 + 3 \times 7^4$. The use of the decimal system is very general, the choice of ten as the radix being probably suggested by the number of fingers, but other systems have been in vogue. [NOTATION.] The duodecimal system (radix 12) leaves some signs of its existence in the foot (12 inches), the shilling (12 pence), etc.

Scaliger, JOSEPH JUSTUS, scholar, third son of Julius Caesar Scaliger, was born at Agen, in the department of Lot-et-Garonne, France, in 1540. He was educated at the College of Guienne at Bordeaux, but, as his father's amanuensis, acquired a sound knowledge of Latin and habits of observation. In 1558 he went to Paris University, where he mastered Greek and made some progress in Hebrew and Arabic. He afterwards spent several years in teaching (for which his qualifications were exceptional and his scholarship consummate) and afterwards travelled in different countries of Europe. At Valence, whither he went in 1570, he studied jurisprudence under Cujas, the celebrated jurist. Being a Protestant convert, he fled after the massacre of St. Bartholomew to Geneva, where he lectured for a while; but lecturing was not to his taste, and, returning to Poitou in 1574, he spent twenty years in broken but fruitful study. His *Conjectanea in Varronem* (1564), and his editions of Festus (1576), Catullus, Propertius, and Tibullus (1577) marked a new era in historical criticism, and the *De Emendatione Temporum* (1583) established a new and sound system of chronology. His reputation now brought him an invitation from the university of Leyden, and in 1591 he succeeded to the chair of Lipsius on the understanding that he should not lecture. During the earlier period of his stay in Holland his reputation stood at its highest, but his declining years were poisoned by an attack, not wholly unprovoked, by the Jesuit Gaspar Scioppius. Scaliger had been brought up in the belief that his family was of noble birth and that his father (and therefore himself) was a prince of Verona. His pride in his ancestry was so inordinate that, in 1594, he was betrayed into publishing an account of this in his *Epistola*. Upon this Scioppius seized with avidity and in his *Scaliger Hypobolimaicus* ("The Supposititious Scaliger") exposed the falsity of the claim. The blow was crushing, and the humiliation is believed to have shortened his days. His last work was the *Confutatio Fabulae Burdonum*, in reply to his critic, successful in almost every respect excepting the main point of the family tree. He died at Leyden on January 21st, 1609.

Scaliger, JULIUS CAESAR, philosopher and man of science, was born at La Rocca, on the Lake of Garda, Italy, in 1484, became page to the Emperor Maximilian, and until 1514 followed with much distinction the profession of arms. He then entered the university of

Bologna, and for some few years combined fighting with the study of medicine, until in 1525 illness compelled him finally to abandon the sword. He spent the remaining years of his life at Agen. He attacked Erasmus in a violent and overbearing style, wrote a Latin grammar, and began a treatise on Poetics, but his really important work was the exposition, in a series of commentaries, of the *Physics* and *Metaphysics* of Aristotle. Scarcely anything was published by him until just before his death, when his *Exercitationes* on Girolamo Cardano's treatise *De Subtilitate Rerum* (1551) appeared, and for many years remained a popular text-book of Aristotelianism. He died at Agen on October 21st, 1558. The enemies of his illustrious son derided the claim of noble birth and asserted that Julius Cæsar Scaliger was born at Verona, the son of Benedetto Bordone, a schoolmaster or illuminator, that he was educated at Padua, where he took the degree of M.D., and that the rest of his story till his arrival in Agen was *ben trovato*. There seems to have been some foundation for these counter-statements.

Scallop, a shell-bearing mollusc of the family Pectinidæ. It is wholly marine in habit, ranging from three to forty fathoms. It lies on its right side and fattens at its ease. Its body is bright orange or scarlet, the shell being characterised by its brilliant red and yellow colouring, its elegance of shape and ornamentation. The shell is often employed for "scalloped oysters" (oysters baked with bread-crumbs, cream, butter and condiments. Though the shell has been generally replaced by a dish, this is called a "scallop"). *Pecten maximus*, the "Scallop" of London, the "Queen" of Brighton, and the "Frill" of Dorsetshire and Devonshire, is a favourite article of diet, but, unlike the oyster, requires to be cooked. *Pecten Jacobæus* was known as "St. James's Shell," because pilgrims from the Holy Land adopted it as a badge. Fossil *Pecten* found in the sub-Apennine formation of Italy were fondly supposed by early writers to be relics dropped by the way by those devout wanderers. Old *Pecten* are mostly sedentary, mooring themselves by their byssus to stones and other objects, but the young swim freely by rapidly opening and closing their valves. Henry Woodward says that while dredging off Corunna, he has seen *Pecten opercularis*, two inches in diameter, swim rapidly out of the dredge as it was being hauled up. A Frenchman, who had undertaken to establish a Scallop farm on a New England beach, ignorant of the mollusc's skill in swimming, deposited several thousand Scallops in shallow water, expecting them to breed, but when he looked at them next day found that they had all taken French leave. The baby Scallop, however, attaches itself by a thread to eelgrass, or other seaweed, at the bottom and remains stationary until it is well grown, when it cuts the painter and sets out on its travels. This shell-fish is a

particular favourite in the United States, and its threatened disappearance from New England waters—due to reckless fishing and particularly to the indiscriminate appropriation of seed Scallops for the market—induced the Massachusetts Fisheries Commission to experiment in the propagation of the mollusc by artificial means. The problem was to ascertain how far it was practicable to remove the eggs from the spawning Scallops and fertilise them by hand, rearing the young in what was styled a kind of "Marine Kindergarten." The Scallop seldom lives for more than twenty or twenty-two months, practically never surviving its second year. Moreover, since it does not spawn until it is a year old, all taken before they have attained this age—the "seed Scallops" of the fisherman's vocabulary—have no chance whatever of breeding. The mollusc spawns in early summer, and as the young develop at a surprising rate they are big enough for the market by the early autumn and consequently fall an easy prey to heedless fishermen, who have no thought of the future. There is no reason why Scallop farms should not answer, provided means are taken to avoid such an experience as befell the enterprising Frenchman aforesaid. Of course it is always possible to close compulsorily certain areas for a given period, until, that is, the mollusc has had time to re-stock the waters. An even more useful policy would be to include simple classes on marine biology in the technical curriculum of the schools in fishing towns and villages.

Scalp, the term applied to the tissues covering the bony cranial vault. Beneath the skin of the scalp there is a layer of subcutaneous fat, and below this lies the occipito-frontalis muscle with its aponeurosis; deeper still is a layer of connective tissue covering the pericranium. The skin of the scalp is very thick, and is intimately adherent to the underlying aponeurosis. Scalp injuries are said to be particularly apt to be followed by inflammatory troubles and by erysipelas. The North American Indians removed the scalps of their captives as trophies of victory. The scalp being seized by the scalp-lock (the red man always wore one lock or tuft of hair long by way of taunting challenge), a circular cut was made with a scalping-knife and the skin (with the hair growing on it) then torn off. One feature of this cruel operation, which an adept performed in a few seconds, was that it did not necessarily involve the death of the victim. Apparently the hairier the scalp the greater was the delight of the triumphant brute.

Scammony, a valuable purgative resin obtained from the milky latex in the long taproot of *Convolvulus Scammonia*, a native of the Levant from Syria to the Crimea. The drug has been used since the 3rd century B.C., and is now chiefly collected in Asia Minor and near Aleppo, the best, which is unadulterated with earth and grey in colour, being shipped from

Smyrna. It contains the resin jalapin or scammonin ($C_{15}H_{15}O_4$). This drug and its preparations are employed in medicine for their purgative properties. The compound scammony pill and powder are administered in doses of from 5 to 12 grains, and the scammony mixture is employed in doses of half an ounce in children.

Scanderbeg (that is, ISKANDER or ALEXANDER BEY), the name given to GEORGE CASTRIOTA, the patriot, who was born in Albania about 1404, and sent when a boy to the Ottoman Court as a hostage to Amurath II. and brought up in the Mohammedan creed. In 1443, being in command of a force against the Magyars, he conspired with John Hunyadi to free Albania, and, having obtained possession of Croia, the capital, he embraced Christianity and independence. In 1461 Mohammed II. was compelled to recognise him, but three years later he again plunged into war with Turkey, and died at Alessio, in Albania, in 1467.

Scanderoon (Turkish, ISKANDERUN), or ALEXANDRETTA, a seaport of Asia Minor, or Syria, picturesquely situated on the Gulf of Iskanderun, at the very extremity of the coast of Syria, where it forms an angle with Asia Minor. As the Mediterranean port of Aleppo (70 miles to the south-east) and the outlet Westwards of the trade of the Euphrates valley, its commercial importance is very considerable. It was founded by Alexander the Great to commemorate his defeat of the Persians under Darius III. in 333 B.C. at Issus, the field of which is believed to have been in the proximity. Pop. variously estimated at from 1,500 to 7,000.

Scandinavia, a collective name for the northern territory in Europe embracing Denmark, Norway and Sweden and the adjoining islands, including, however, Iceland, which is an appanage of the Danish Crown. Norway and Sweden together are often spoken of as the Scandinavian Peninsula. Ancient writers designated as Scandia a large island in the Baltic, conjectured to have been Zealand, the mainland farther north being scarcely known to them.

Scania, an old province of Sweden, occupying the southern extremity of the kingdom and now represented by the läns, or governments, of Christianstad and Malmöhus, with a combined area of 4,352 square miles.

Scansores. [OLIMBERS.]

Scape, an inflorescence rising directly from an underground stem. It may be one-flowered, as in the tulip and crocus, or many-flowered, as in the hyacinth or cowslip. The inflorescence of anemone is termed a scape, and the three leaves below the flower are considered as bracts because there are other radical leaves, whilst the four leaves below the flower of Herb Paris are considered as foliage-leaves because there are no others. The term scape is not strictly

applicable to such cases as this last and that of the lily-of-the-valley, where the branch from the underground stem bears one or two foliage-leaves below the inflorescence. Whilst the hyacinth is a racemose scape, the cowslip is an umbellate and the daisy a capitulate one.

Scapegoat, the goat on the head of which the Jewish high-priest, on the Day of Atonement, placed both hands the while he confessed over it all the sins of the Israelites, laying them on its head and then sending it out into the wilderness. William Holman Hunt, the famous



THE SCAPEGOAT. (By Holman Hunt.)
(From the original in the possession of
Sir Cuthbert Quilter.)

pre-Raphaelite artist, painted in 1854 a very impressive picture of "The Scapegoat," the local colour and accessories of which were painted in Palestine. "While the hills of the Crimea were white with tents of war," wrote John Ruskin, "and the fiercest passions of Europe burned in high funereal flames over their innumerable dead, one peaceful English tent was pitched beside a shipless sea; and the whole strength of an English heart spent in painting a weary goat, dying upon its salt sand. . . ." The view taken by the Jews of the appointed sending forth of the scapegoat into the wilderness was that it represented the carrying away of their sins into a place uninhabited and forgotten, and that the animal on whose head the sin was laid, became accursed; so that though not commanded by the law, they used to maltreat the goat, Azazel, to spit upon him and to pluck off his hair. "The goat, thus tormented, and with a scarlet fillet bound about its brow, was driven by the multitude wildly out of the camp: and pursued into the wilderness. The painter supposes it to have fled towards the Dead Sea, and to be just about to fall exhausted at sunset—its hoofs entangled in the crust of salt upon the shore. The opposite mountains, seen in the fading light, are that chain of Abarim on which Moses died." [AZAZEL.]

Scaphoid, the name applied to two bones of the human skeleton, one in the wrist and one in the foot.

Scaphopoda, a class of Mollusca, the members of which have a univalve shell shaped like a tusk, and composed of white ivory-like material.

The animal has a head, and thus belongs to the group *Glossophora*. The head is, however, somewhat imperfectly developed, is cylindrical in form, has the mouth at the anterior end, and is surrounded by a circle of tentacles. The class is further characterised by the absence in its members of a heart or gills. The shell is open at both ends. The animal lives in the sand along the coast. There are three living genera. *Dentalium entale*, the common Elephant-tooth Shell, is the best known species. The class dates from the Carboniferous.

Scapula, or SHOULDER-BLADE, the triangular-shaped bone which lies upon the upper and posterior part of the thorax, connected with the sternum through the mediation of the clavicle, and articulating with the humerus. From the upper part of the posterior surface of the scapula there projects a bony ridge, which is called the spine of the scapula; above this lies what is called the supra-spinous fossa, and below it is the infra-spinous fossa. From the external extremity of the spine two processes project, one called the coracoid process, and the other the acromion process. The clavicle articulates with the latter process. Several of the important muscles of the back and shoulder are attached to the scapula.

Scarabæus, a genus of beetles, belonging to the Scarabæidæ, of the Lamellicornia. There are about seventy species found in Africa and the south of Europe and Asia. They are confined to the Old World and none is found in the north temperate zone. They live on dung, laying their eggs in balls which they roll up.



SCARABÆUS.

The sacred beetle of Egypt (*S. sacer*) is found in the shores of the Mediterranean Sea. The lypeus, or front part of the head extended as a semicircular shield over the mouth, is divided by sharp notches into a series of

triangular teeth. In repose the tooth-like projections of the anterior shanks flank the forepart of the body, owing to the fore legs being then retracted. It is conjectured that either the resemblance to sun-rays thus produced or the singular instincts of this insect led to its being regarded by the Egyptians as sacred. It is common in Lower Egypt and is considered to be that most frequently represented on monuments. Latreille, however, believed that *Scarabæus Egyptiorum*, a brilliant golden-green kind found on the Upper Nile, was the species originally worshipped.

Scarborough ("the town on the scar or rock"), the Queen of watering-places, North Riding of Yorkshire, England, finely situated on the North Sea, 40 miles N.E. of York, about midway between Whitby and Flamborough Head. The bold promontory jutting out to sea forms two bays (of unequal size) and divides the town practically into two. The North Town commands a less fashionable *clientèle* than the South, but both are equipped with good sands and are alike in possessing a bracing, healthy climate. The older quarter of the town runs inland from the castle rock, the fortress in earlier days affording the inhabitants necessary protection. The castle, now in ruins, appears to have been built in the beginning of the 12th century, and was employed for a period alternately as a royal residence and a royal prison. King John and Edward II. both visited it. It was besieged in 1312 by the Earl of Pembroke and in 1356 by Sir Robert Aske, one of the leaders of the Pilgrimage of Grace. Held for Charles I. during the Civil War, it was besieged twice and captured, being partially destroyed on the second occasion (1648). George Fox, the Quaker, was confined in it in 1655. On the north and east it was defended by the sea and on the south and west by the keep and curtained wall. The discovery of mineral waters in 1620 gave the place a vogue as a spa, but though it has enjoyed increasing reputation as a health resort the springs (*chalybeate*) are not now the primary attraction. St. Mary's Church on the hilly promontory on which the old town was laid out is a venerable structure whose fabric illustrates the various styles from the Norman of Stephen's reign to the Perpendicular of the time of Richard II. The choir was almost entirely destroyed in the Civil War, but the church otherwise was restored in 1850. In the churchyard Anne Brontë ("Acton Bell") was buried in 1849. Among more prominent buildings are the handsome Spa (1880) in the Italian style, the People's Palace and Aquarium in an Oriental style, the Museum in the Roman-Doric, the Market Hall in the Tuscan, the New Town Hall, the Public Hall (formerly the town hall), and several literary, scientific, educational and charitable institutions, such as the Royal Northern Sea Bathing Infirmary, the Seamen's Hospital and Trinity House. The old and new harbours both seek the shelter

of the castle hill. There is a handsome esplanade or drive round each bay and a promenade pier on the North Sands. The ravine between the northern and southern areas has been laid

both instruments was arranged between the two executants. The performances on the harpsichord were of equal merit, but on the organ Handel was *facile princeps*. Afterwards



SCARBOROUGH.

[Photo: Chester Vaughan & Co.]

out very picturesquely and is spanned by bridges. The industries are confined mostly to the fisheries and jet manufacture, and some trade is carried on at the harbour, the only port of any consequence between the Humber and the Tees. Lord Leighton, President of the Royal Academy, was born here in 1830. Pop. (1901), 38,161.

Scarlatti, ALESSANDRO, composer, was born at Trapani, in Sicily, in 1659, and, after a musical training by Carissimi, became in succession *maestro di cappella* to Queen Christina of Sweden, the Viceroy of Naples, and Cardinal Ottoboni. He was a most prolific yet careful writer, a master of counterpoint, the inventor of recitative, and the founder of the Neapolitan school. His first opera *l'Onesta nell' Amore* was performed in Rome in 1680 and his first oratorio, *I Dolori di Maria sempre Virgine*, was produced in 1693, but very few of his works have been published. He died at Naples on October 24th, 1725. DOMENICO SCARLATTI, his son, was born at Naples in 1683. His fame rests mainly on his skill as player both of the harpsichord and the organ. During Handel's visit to Italy in 1708-9 a trial of skill on

whenever Scarlatti's organ-playing was praised, his rejoinder was, "You should hear Handel!" In 1715 he was entrusted with the musical arrangements at St. Peter's, Rome. He conducted a performance of his *Narciso* at the King's Theatre, London, in 1719. It is of distinct interest to record that one of his earliest operas, *Amleto* (produced at Rome in 1715), was the first attempt to render Shakespeare's tragedy as a musical drama. He died at Naples in 1757.

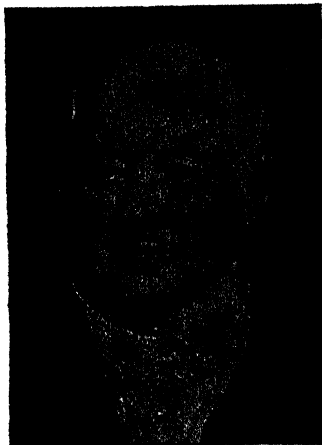
Scarlet Fever, or SCARLATINA, an infectious malady characterised by a peculiar punctiform eruption attended by sore throat and febrile disturbance. The incubation period of the disease varies from about 24 hours to 6 or 8 days. The invasion is usually marked by shivering, headache, often vomiting, and soreness of throat. On the second day of the illness the rash appears, usually upon the chest first, but soon becoming generally diffused. The rash is "fully out" on the third or fourth day, and then begins to fade; when it has disappeared, the skin commences to desquamate, the cuticle separating in scaly flakes, which are most prominently developed on the palms of the hands

and soles of the feet. The temperature is usually markedly raised on the first day of the disease, and the patient remains in a feverish condition during the development of the rash; the pulse is much accelerated also during this period. In some instances the disease assumes quite a mild form (scarlatina simplex); in others the throat is particularly involved (scarlatina anginosa), when a condition of diphtheritic inflammation may be present. The severest form of scarlatina is the malignant variety, in which death sometimes occurs before the rash has had time to develop. There are several sequela of scarlet fever, to which reference must be made. Conjunctivitis, otitis, and rhinitis may be present. There is sometimes rheumatic mischief, and inflammation of the serous membranes may occur. The most important sequela of the disease is albuminuria, associated with involvement of the kidneys. If these organs are seriously affected, there is marked dropsy, and a uræmic condition may supervene. Scarlet fever usually affects young children, and second attacks of the disease are rare. It is generally produced by the transmission of the poison from some infected person or object. It is not uncommonly conveyed by infected milk. Treatment consists in isolation of the patient, who should be kept at rest in bed and fed upon light diet. Exposure to draughts should be avoided, and the possible supervention of complications carefully watched for, so that appropriate treatment may be employed without delay. If the patient be not removed to the hospital, the most rigid precautions must be taken to guard against the spread of infection. In England an outbreak of scarlet fever, even in a single case, must at once be notified to the sanitary authority.

Scarlet-Runner (*Phaseolus multiflorus*), a native of Mexico, is a climbing bean now much cultivated in England, with a thick tuber, annual twining branches, and scarlet or white flowers on many-flowered peduncles, which are succeeded by rough pods. These are eaten when green. The ripe seeds are purple with black dots.

Scarlett, JAMES, 1ST BARON ABINGER, Lord Chief Baron of the Exchequer, was born in Jamaica on December 13th, 1769. He was sent to England in 1785 to complete his education and graduated at Trinity College, Cambridge. Called to the bar in 1791, he joined the northern circuit, which he followed till 1807, and became a King's Counsel in 1816. Three years before he had acquired an estate at Abinger, in Surrey. In 1819 he was elected M.P. for Peterborough, in the Whig interest, and continued to represent the town, excepting a brief interval, until 1830. In Canning's ministry he accepted the post of Attorney-General and was knighted in 1827. Political conviction sat lightly on him, however, and he went to fill the same office for the Duke of Wellington in 1829. He was responsible for the Act in virtue of which the county palatine

of Chester and the principality of Wales were deprived of their separate jurisdiction (1830). In 1830 he was elected M.P. for Maldon and by now was fully qualified to denounce Reform without qualm or scruple. This tergiversation necessitating a change of seat he was returned for Cokermonth in 1831 and, in the following year, for Norwich. In December, 1834, he was appointed Lord Chief Baron of the Exchequer, and in the ensuing January was



THE RIGHT HON. LORD ABINGER (JAMES SCARLETT).

(After the painting by
Sir Martin Archer Shee, P.R.A.)

created Baron Abinger. He died at Bury St. Edmunds on April 7th, 1844. At the bar he was the most successful advocate of his time, though neither a great lawyer nor an orator. He owed his pre-eminence to his skilful handling of juries and, as some averred, of judges also. His knowledge of human nature was unsurpassed, he was keen to seize a point, and his self-possession was imperturbable. He did not repeat his forensic success on the bench and by his dictatorial manner, vanity and partiality repeatedly gave umbrage to juries. His son, General SIR JAMES YORKE SCARLETT (1799-1871), was leader of the Heavy Brigade in their famous charge at Balaclava. If the world has heard less of the Heavies in that affair, this was because Tennyson immortalised the Light Brigade in his wonderful ballad, but in point of fact the ride of Scarlett's Three Hundred was an act of sublime heroism. With a squadron of Inniskillings and two squadrons of Scots Greys he charged the Russian cavalry, 3,500 strong, under General Ryloff, uphill and stayed the Muscovite attack. His men having bewn their way to the back of the Russian column, turned to cut their way back to the front. The advent of a second squadron of Inniskillings, the 5th Royal Dragoon Guards and the Royals com-

pleted the discomfiture of the enemy. Next year Scariett was created K.C.B.

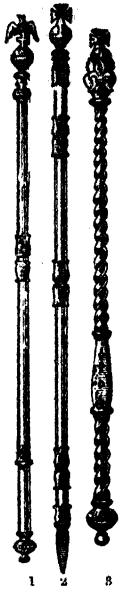
Scarron, PAUL, playwright and novelist, was born in Paris on July 4th, 1610. His father, a member of the Parlement of Paris, having married again, Paul was unable to agree with his stepmother and left home, became an *abbé*, and went to Rome about 1634. He had led a dissolute life at Le Mans and elsewhere, and being badly treated for some serious disease, was doomed to spend the last twenty years of his life a deformed, pain-racked cripple. His versatile gifts for literary composition came to his rescue, aided by an adroit skill as a begging-letter writer, and he managed to scrape along somehow, enjoying the patronage even of the king and Court. His comedy of *Jodelet* (1645) hit the public taste, and he returned to Paris in 1646. His *L'Héritier Ridicule* (1648) was even more popular. Between 1648 and 1653 appeared at intervals his *Virgile Travesti*, which, though essentially an ignoble performance—since it is always a poor thing for a man of real genius to parody any of the deathless works of the world—enjoyed a high reputation in his own day. In 1651 his greatest work was published, *Le Roman Comique*, a recital of the adventures of a company of strolling players, that was practically the first French novel. In 1652 a touch of romance was introduced into his sombre and sordid life by his marriage with Françoise d'Aubigné, a lovely girl of seventeen, whom he married to save from a nunnery. She loyally accepted her lot, and after his death became known to fame as Madame de Maintenon, mistress, and afterwards wife, of Louis XIV. In 1653 his comedy of *Don Japhet d'Arménie*, perhaps his masterpiece in this line, was produced. His latter years, owing to the management of his wife, were passed in some degree of comfort and even refinement, but his sufferings were constant, and often amounted to torture, borne with indomitable pluck and a gaiety of spirit that is almost pathetic. "If there be a hell, I have nothing to fear from it," he wrote, "having endured it in this world." He died in Paris, on October 6th, 1660. To describe him as the creator of French burlesque is to narrow the range of his accomplishments, for he was an ornament of French literature.

Scepticism (Greek, *skeptomai*, "I consider"), as a philosophical term, denotes the attitude of mind which subjects all belief or opinion, whether based on ecclesiastical dogma or "common sense," to the criticism of the human intellect. The term does not properly connote disbelief or even doubt—though, as Tennyson phrased it, "there lives more faith in honest doubt, believe me, than in half the creeds"—but, as the ultimate basis of things is insoluble for human reason, the spirit of doubt may be regarded as its natural outcome. It is, however, the voice of prejudice rather than of science to define scepticism summarily in general terms as a denial of the possibility of

objective knowledge. Doubt, and not denial, is the note of scepticism. The love of truth is not the prerogative of any system of philosophy, and doubt, sincerely felt, must yield when the difficulties have been removed. Until they have been overcome it will remain; if they cannot be surmounted, then to that extent and on that particular subject scepticism would seem to be justified. But to regard scepticism as synonymous with negation is unsound on every ground. It is true that many of the ancient philosophers split hairs, or juggled with words, or argued merely for the sake of arguing, and that their verbal wrangling was a weariness to the flesh, but these weaknesses are common to most if not all schools of philosophy. Denial certainly goes a long step farther than doubt, which, honesty of thought and purpose being postulated, may alternatively be defined as suspense of judgment for want of evidence or want of knowledge. The Sceptics were a Greek school of philosophers founded by Pyrrho. The Sophists held very similar views. David Hume is commonly regarded as the representative of modern scepticism, the latest development of which is agnosticism.

Sceptre (Greek, *shēptron*, "staff"), originally a staff for the aged, but in the Iliad already the badge of military, judicial, or religious authority. Specimens of the sceptres used by Etruscan kings and priests, consisting of hollow gold truncheons adorned with beautiful designs, are preserved in the British Museum. In the days of the Roman republic an ivory sceptre was borne both by the consul and the victorious general (*imperator*), and was thus the prototype of the modern marshal's baton. When the emperor had superseded both, the ivory staff was surmounted by a golden eagle, which, after the introduction of Christianity, was frequently replaced by a cross. Both these types were in use during the Middle Ages. A fine collection of old English sceptres was destroyed by the Puritans. Of the six sceptres now preserved with the Regalia in the Tower of London, four date from the reign of Charles II., one from that of James II., and one from the coronation of William and Mary. Amongst them are St. Edward's Staff, of beaten gold, 4 feet 7 inches in length, which is carried before the sovereign at the coronation; the Sceptre Royal, or King's Sceptre with the Cross, made of gold, 2 feet 9 inches long, and set with precious stones, which is placed in the monarch's right hand by the Archbishop of Canterbury at the coronation; the King's Sceptre with the Dove (the symbol of mercy), also of gold, 3 feet 7 inches long, and set with jewels, placed in the sovereign's left hand; the Queen's Sceptre with the Cross, like unto the King's, but not quite so large; the Queen's Ivory Rod, originally made for the queen of James II., 3 feet 1½ inch long, of white ivory, gold-mounted; and the Queen's Sceptre with the Dove, resembling the King's Sceptre with the

Dove, and supposed to have been fashioned for Queen Mary, the consort of William III. The Sceptre of the Scottish Regalia, preserved in Edinburgh Castle, presents some interesting features. It is believed to have been made for James V., and its total length is 34 inches. On the top of the stalk is an antique capital of leaves and small statues of the Virgin, St. Andrew, and St. James, and above is a great crystal beryl. The beryl was an amulet which had formed part of the more ancient sceptre of the Scots kings. Such beryls are supposed to have been the official badge of the Arch Druid, and among the Highlanders were known as "stones of power."



- 1 2 3
(1) SCEPTRE
WITH DOVE.
(2) ST. EDWARD'S
STAFF.
(3) SCEPTRE
WITH CROSS.

Schadow, JOHANN GOTTFRIED, sculptor, was born at Berlin on May 20th, 1764, and became the favourite pupil of the sculptor Tassaert. Some two hundred of his works adorn the chief cities of Germany, among which may be named "Frederick the Great," at Stettin; "Marshal Blücher," at Rostock; and "Martin Luther," at Wittenberg. He modelled Goethe, Wieland, and Fichte from life, and two of his strongest compositions were the four-horsed chariot (quadriga) on the Brandenburg Gate, and his frieze on the Royal Mint in Berlin. He wrote on art, and died at Berlin, on January 28th, 1850. **RUDOLPH SCHADOW**, his eldest son, was born in Rome on July 9th, 1786, and studied sculpture first under his father and then under Thorwaldsen and Canova. He especially affected imaginative subjects, such as the "Spinning Girl," "Maiden Fastening her Sandal," "Dancing Girl," "Discus-thrower," and a colossal "Achilles with the Body of Penthesilea." He was cut off prematurely at Rome on January 31st, 1822. **GODENHAUS FRIEDRICH WILHELM SCHADOW**, painter, second son of Johann Gottfried Schadow, was born at Berlin on September 6th, 1789. After studying under his father, he went to Rome in 1810 with his brother Rudolph. In 1819 he was made professor in the Berlin Academy, and in 1826 succeeded to the directorship of the Düsseldorf Academy, which under him achieved high distinction, his talents as a teacher and encourager of others transcending his merits as a painter. Among his works were "Christ and the Pharisees" (1827), "The Four Evangelists" (1828), "The Queen of Heaven" (1833), "Christ on the Way to Emmaus" (1835), "Mater Dolorosa" (1836), and "The Wise and Foolish Virgins" (1843). He died at Düsseldorf on March 19th, 1862.

Schaffhausen, a canton of Switzerland, the most northerly tract of the Confederation, lying on the right or German side of the Rhine, which divides it from the cantons of Zürich and Thurgau. It is bounded on the W., N. and E. by the duchy of Baden. It occupies an area of 114 square miles. It is largely under cultivation, the chief crops being cereals, potatoes, hemp, and grapes. Live-stock also is raised, the Klettgau breed of pigs being in some repute. Pop. (1904), 42,628.

Schaffhausen, capital of the preceding canton, Switzerland, on the right bank of the Rhine, 23 miles N. by E. of Zürich. Among the principal buildings are the cathedral, with its great bell bearing the clanging legend, *Vivos voco, mortuos plango, fulgura frango* ("I summon the living, I bewail the dead, and I break the lightning-flash"); the Castle of Munoth, up the tower of which one may drive by the spiral ascent; the Imthurneum, a species of People's Palace, the gift of a London Swiss, and the Public Library. The industries include iron-founding, machinery, textiles, railway-carriage building, watch-making, pottery, and wine-making. Two miles to the south-south-west are the famous Falls, where the Rhine descends 100 feet, the steepest fall making a vertical drop of 60 feet. The town itself lies 1,295 feet above the sea. Pop. (1900), 15,403.

Schall, JOHANN ADAM VON, missionary, was born at Cologne, Germany, in 1591, and, becoming a Jesuit, was selected to lead a mission into China. He met with a favourable reception from the emperor Schun-che, was created a mandarin, and allowed to erect churches and convert the natives. He was also engaged in the work of reforming the Calendar, along with his senior colleague Père Terentius, on whose death he continued his labours. He was appointed Director of the Bureau of Celestial Affairs and President of the Tribunal of Mathematics. Having superintended the Chinese gun-foundry he may be said to have been largely instrumental in enabling the people to repel a Tatar invasion. He seems to have incurred the enmity of Kang-he, the succeeding emperor, for he was condemned to be cut into pieces, but died in prison in 1669, ere the barbarous sentence was carried out.

Schaumburg-Lippe, a principality of Germany, enclosed by the Prussian provinces of Hanover (on the north) and Westphalia (on the south). It covers an area of 131 square miles, partly hilly and partly fertile plain, producing excellent crops of grain and flax. The industries comprise yarn-spinning, linen-weaving, and coal-mining. The principal natural feature is an extensive lake in the extreme north called the Steinhuder Meer. The lords of Lippe (that is, of Lippe-Detmold and Schaumburg-Lippe) founded one of the most ancient of German reigning families. In 1613 the old line was broken into three branches, of which one died out in 1709. The ruler of

18 SALAR J.

Schaumburg-Lippe became a sovereign prince in 1807, and in 1866 sided with Austria, but afterwards entered the German Confederation. The principality sends one member to the Bundesrat and one to the Reichstag. The capital is Bückeburg (5,625). Pop. (1900), 43,132, almost wholly Protestant.

1781 he discovered the composition of tungsten, which has been re-named scheelite; in 1783 he discovered glycerine, and demonstrated that an acid was necessary to the production of the colouring matter of Prussian blue, and this acid was afterwards called prussic acid. In conducting the last experiments he discussed



THE FALLS OF SCHAFFHAUSEN.

[Photo: Frith & Co., Reigate.]

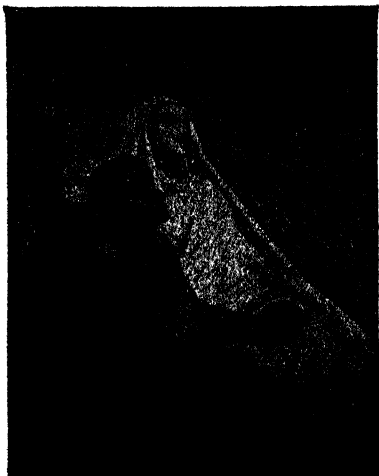
Scheele, KARL WILHELM, one of the most brilliant of experimental chemists, was born at Stralsund, a town of Pomerania, which then belonged to Sweden, on December 19th, 1742. At the age of fourteen he was apprenticed to an apothecary in Gothenburg, where he studied chemistry zealously, and conducted many researches which gave him remarkable manual dexterity. In 1765 he proceeded to Malmö, and in 1770 to Stockholm, where he discovered hydrofluoric and tartaric acid. In 1773 he removed to Upsala, and next year obtained the salts of manganese and showed its effect on the colouring of glass. This he followed up, in 1775, with the discovery of benzoic and arsenious acids and the arsenite of copper, named in his honour Scheele's green. In the same year he flitted to Köping, at the western extremity of Lake Malar, where he died on May 19th, 1786. During the last eleven years of his life his labours were unceasing. In 1777 his important treatise on *Air and Fire* appeared, in which he announced his discovery of oxygen (which, however, Priestley, unknown to him, had anticipated in 1772). Amongst other acids which he obtained were molybdic, lactic, mucic, citric, malic, oxalic, and gallic. In

the composition, smell, taste, and properties of the body without being aware of its deadly nature. Considering his poverty, the imperfect appliances of the time, and the still tentative stage of chemistry, Scheele's work must be pronounced to be amongst the most brilliant in the whole history of scientific investigation.

Scheffel, JOSEPH VICTOR VON, poet, was born at Carlsruhe, capital of Baden, on February 16th, 1826, and educated at Munich, Heidelberg, and Berlin, for the law, which he soon abandoned for literature. His first venture was a collection of student songs entitled *Gaudeamus* (1853). This was followed by *Der Trompeter von Säckingen* (1854), *Ekkehard* (1855), *Frau Aventure* (1864), *Juniperus* (1866), *Bergpsalmen* (1870), and *Waldeinsamkeit* (1877). In 1884 he published his last work, *Hugideo*, dying in Carlsruhe on April 9th, 1886.

Scheffer, ARY, painter, was born at Dordrecht in Holland, on February 10th, 1795. On the death of his father his mother removed to Paris and placed Ary in the studio of Guérin. He achieved considerable success as a *genre-painter* with such productions as "La Veuve du Soldat"

and "Le Retour du Conscrit." Later he produced his well-known illustrations of "Faust," "Mignon," "Francesca da Rimini," "Dante and Beatrice," and the "Giaour," between 1827 and



"ST. AUGUSTINE AND MONICA."
(From the painting by Ary Scheffer.)

1836. He was now drawn to religious subjects, and during the next ten years painted "Christus Consolator," "Christus Remunerator," "St. Augustine and Monica," and other kindred works. He died at Argenteuil, France, on June 15th, 1858. His devotion to the Romantic movement was unquestionable, but it probably cost him his place in Art. At the same time his thin colour, forceless drawing, and lachrymose sentiment were defects too pronounced to be saved by a certain charm and ease of composition.

Scheldt, or **SCHELDE**, or **ESCAUT** (French), a river which rises near Catelet, Aisne, France, and flowing north for 75 miles, enters Belgium near Mortagne, and, after traversing Belgium to Antwerp, a distance of 137 miles, divides into two branches, the East and the West Scheldt, which pursue a further course of 37 miles through the Netherlands till they find their way by various estuaries into the North Sea, after enclosing the Dutch islands of North and South Beveland and Walcheren. It has upon its banks the towns of Cambrai, Denain, Valenciennes, Fontenoy, Tournai, Oudenarde, Ghent, Dendermonde, and Antwerp, and is connected by canals with many other places, being navigable almost throughout its entire length. It receives on the left the Scarpe and Lys and on the right the Selle, Dender, and Rupel.

Schelling, **FRIEDRICH WILHELM JOSEPH VON**, philosopher, was born at Leonberg, in Würtemberg, Germany, on January 27th, 1775. He

completed his education at Tübingen, where he began his friendship with Hegel. As early as 1793 he came under the influence of Kant's metaphysics as modified by Fichte, and wrote two treatises which commended him to the latter teacher, and in 1798 he was appointed professor of philosophy at Jena. He now developed views somewhat opposed to those of his patron, and these he embodied in the *Naturphilosophie* (1799) and the *Transcendentalen Idealismus* (1800). In 1803 he left Jena, having married, by amicable arrangement, the divorced wife of A. W. Schlegel, and, after a brief residence at Würzburg, was called by the King of Bavaria to a post in the Munich Academy (1806), being ultimately promoted to a professorship in the new university (1827). In 1841, at the invitation of the King of Prussia, he went to Berlin as a supporter of orthodoxy. In later life his philosophy developed in the direction of mysticism. He died at Ragatz, Switzerland, on August 20th, 1854.

Scheltopusik (*Pseudopus Pallasii*), a reptile belonging to the family Zonuridæ, of the sub-order Brevilingues, of the order Lacertilia or Lizards. It is a dark, chestnut-brown, glassy, snake-looking creature, about two feet long, not readily distinguished from some of the so-called Blind Snakes (*Typhlopidae*). It occurs in Central Russia, Hungary and Dalmatia. It has rudiments of hind limbs in which a small femur is hidden, but has no digits. Internally, there are traces of the shoulder- and pelvic-girdles and one lung is somewhat smaller than the other. It is quite harmless and feeds on insects, worms, frogs and young mice.

Schemnitz (Hungarian, **SELMECZ**), a town of the county of Hont, Hungary, 65 miles N. of Budapest. It is the mining centre of the country, the mines having been known and worked since the Roman period. They yield gold, silver, lead and copper, and the excavated galleries now exceed a total length of 200 miles. Maria Theresa established a mining academy in 1760, and to this was attached a School of Forestry in 1809. In addition to the mining industries there are manufactures of pottery, tobacco-pipes and cigars. Pop. (1900), 16,370.

Schenectady, capital of a county of the same name, New York State, United States, on the right of the Mohawk, an affluent of the Hudson, 17 miles N.N.W. of Albany. It is noted as the seat of Union University, which consists of Union College (founded in 1795 by a friendly bond of various religious sects) and the law and medical faculties and Dudley Observatory, situated in Albany. The public buildings include the court-house, city hall and charitable and educational institutions. The industries comprise the making of locomotives, boilers, bridges and agricultural implements, besides hosiery and shawl factories and electric works. It occupies the site of part of the Mohawks'

hunting-grounds, became a Dutch trading factory in 1620, was burned down by the French and Indians in 1690, and was created a borough in 1765 and a city in 1799. Pop. (1900), 31,662.

Schenkel, DANIEL, theologian, was born at Dögerlin, in the canton of Zürich, Switzerland, on December 21st, 1813, and studied at Basle and Göttingen. He occupied the pulpit for a time at Schaffhausen, but resigned in 1849 to take up the theological professorship at Basle, whence two years later he passed to Heidelberg, where he died on May 19th, 1885. His greatest work, *Das Charakterbild Jesu* (1864), is somewhat rationalistic in tone.

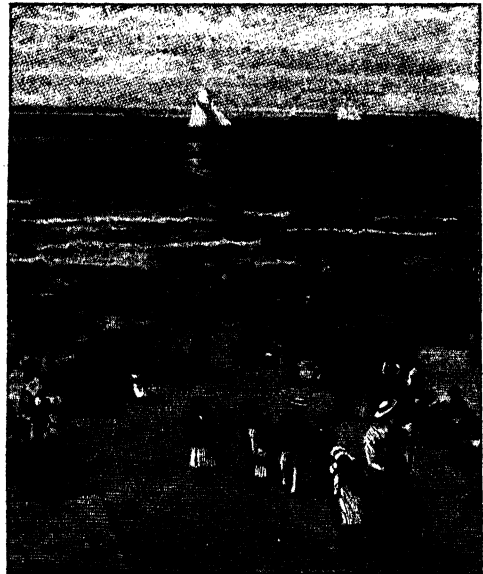
Scherer, EDMOND HENRI ADOLPHE, critic and politician, was born in Paris on April 8th, 1815, and educated partly in England. He studied theology at Strasburg, and in 1843 obtained a professorship of exegesis at Geneva. Here he became closely allied with Vinet, and strongly advocated the divorce between Church and State. He edited *La Réformation au XIX^{me} Siècle*, and wrote much in the way of literary criticism. In 1860 he settled in Paris, joined the staff of the *Temps*, became correspondent of the *Daily News*, and gained a seat in the Chamber in 1871 as deputy for the department of Seine-et-Oise and became a Senator in 1875. He died at Versailles on March 16th, 1889. Among his works may be mentioned *Dogmatique de l'Église Réformée* (1843), *Esquisse d'une théorie de l'Église Chrétienne* (1845), *La Critique et la Foi* (1850), *Alexandre Vinet* (1853), *Études Critiques sur la littérature contemporaine* (1863), *Diderot* (1880), and *Études sur la littérature au XVIII^e Siècle* (1891).

Scheveningen, the most fashionable watering-place in Holland, on the North Sea, 2 miles N.N.W. of The Hague, with which it is connected by a beautiful avenue. The promenade on the front attracts the élite of Dutch society. Sand dunes divide the village from the sea and there is a fine beach with excellent sea-bathing. In the immense Kurhaus is a Kursaal with accommodation for 3,000 persons. The fisheries are the only industry. Off this part of the coast De Ruyter in 1673 defeated the combined armaments of England and France. Pop. (estimated), 20,000, greatly increased during the season.

Schiedam, a town in the province of South Holland, the Netherlands, at the confluence of the Schie and Maas, 3 miles W. of Rotterdam. It has a worldwide reputation as the headquarters of the manufacture of gin or schnapps, of which its name has practically become a synonym. The yeast and the grain refuse from the distilleries—the latter used in the fattening of thousands of pigs—are important articles of export. There are manufactures of candles and glass, in addition to some shipbuilding. Pop. (1900), 27,100.

Schiehallion, a mountain of Perthshire, Scotland, 15 miles W. by S. of Pitlochry and 4 miles S.E. of Loch Rannoch. It is 3,547 feet above the level of the sea. Viewed from the north-west (from the northern shore of the lake named, for example) its summit presents the appearance of a cone, but from the south or east its crest is seen to have an east-and-west direction. The eastern face rises gradually, but the ascent on the west and south is steep. There is pretty general agreement that the climb, so far as the prospect from the top is concerned, will scarcely repay the trouble: this should be noted, as the mountain in any case is not readily accessible. The hill is associated with the experiments conducted in 1774 by Nevil Maskelyne, the Astronomer Royal, to determine the attraction of mountains by deviations of the plumb-line, and with the geological investigations of Dr. John MacCulloch and Professor John Playfair.

Schiller, JOHANN CHRISTOPH FRIEDRICH, dramatist and poet, was born at Marbach, in Württemberg, Germany, on November 10th or 11th, 1759. The reigning duke of Württemberg noticed the boy and adopted him, sending him to study first law and then medicine, neither of which greatly interested the youth, whose



SCHIEVENINGEN: SEA FRONT.

(Photo: M. T. Visser, jun., The Hague.)

ducal patron, though meaning well, was something of a fussy martinet. But relief was at hand. Schiller had given his best energies to the composition of *Die Räuber* (1777), a play directed against the old order of things, and his

patron cast him off. In 1783 he produced *Fiesco* and *Kabale und Liebe* at Mannheim. At Dresden, whither he had gone to pay an extended visit to his friend Körner, he published, in 1787, his play of *Don Carlos*. He now dropped poetry for a time, and began his unfinished *History of the Revolt of the Netherlands* (1788), and *History of the Thirty Years' War* (1792). In 1790 he was appointed professor of history at Jena, and married Charlotte von



JOHANN SCHILLER.

Lengefeld. Later he contributed to periodicals some of his best ballads and lyrics. From 1794 he was on terms of the utmost friendship with Goethe (although they had known each other somewhat for several years) under whose encouragement Schiller went forward to his highest achievements. In 1799 he transferred his home to Weimar, chiefly for the sake of Goethe's society, and set to work upon the great dramas of *Wallensteins Lager*, *Die Piccolomini*, and *Wallensteins Tod*, which were all put on the stage within a few months. *Maria Stuart* (1800), *Die Jungfrau von Orleans* (1801), *Die Braut von Messina* (1803), and *Wilhelm Tell* (1804) occupied him during the next four years, and he was engaged on *Demetrius* when he died, at Weimar, on May 9th, 1805. Not only as a writer of ballads and lyrics, upon which he brought to bear his exquisite sense of beauty in diction and rhythm, but as a dramatist pre-eminently Schiller has earned a place among the world's master poets.

Schists, crystalline rocks in alternating layers or folia of different minerals. On the Continent the term is frequently extended to slates and shale, the constituents of which, though laminated or cleaved, are neither crystalline nor alternating. There seem sometimes to be transitions in the field, on the one hand, from shales, slates, and sandstones to spotted slates—i.e., slates with scattered crystals, quartzites, and true schists; and, on the other hand, between confusedly-crystalline rocks and those that are foliated; but these transitions, even if demonstrated, are not conclusive as to modes of origin. The distinction between schists and foliated rocks—i.e., between schistosity and foliation—is one of minor importance, dependent as it is mainly on the presence in the former case of a laminated mineral, such as mica or talc in masses of considerable surface. Thus gneiss often

passes into mica-schist. The most abundant schists are the light-coloured and but slightly greasy mica-schist, talc-schist, lighter and greasy to touch, often merely the result of the weathering of mica-schist, the dark-green and soft chlorite-schist, and the harder hornblende-schist; but gneiss, quartzite, hornblende-rock, and other rocks which commonly occur in association with these schists, especially in the series known as Archean, are often spoken of with them under the general term of "the Crystalline Schists." Of the two conflicting theories as to their origin, the alleged occurrence of fragments exhibiting the same structure as the main mass in conglomerates at the base of the Cambrian, as at Bangor, is a strong argument against their merely metamorphic origin; whilst it is difficult to explain the formation of gneiss or mica-schist, to say nothing of graphite and crystalline limestone, as precipitates directly from a heated primitive atmosphere. It is now generally admitted that gneiss and hornblende-schist may result from the alteration of granite and diorite, and quartzite is often obviously only a partially-fused sandstone.

Schizocarp, a dry, partly dehiscent, syncarpous fruit, splitting in such a manner as not to disclose its seeds, dividing into bodies known as mericarps, cocci, or nutlets, each consisting of a carpel or of half a carpel, and each generally containing one seed. Though physiologically identical, schizocarps are structurally of two classes—namely, superior, or regmas, and inferior, or cremocarps. As types of the first we have the fruits of the Malvaceæ, Geranium, Tropæolum, and Euphorbiaceæ, which split into their constituent carpels, and those of the Labiata and Boraginaceæ, in which two carpels give, owing to ingrowth of their midribs, four nutlets. The samara of the maples is merely a winged regma. As types of the cremocarp we have the bicarpellate fruits of the Umbelliferae, which, being inferior, are necessarily in part receptacular in origin, and which split into two mericarps.

Schizocole, the name of that type of body-cavity which results from a splitting of the tissues of the animal, and has no connection with the body-cavity of the original embryo.

Schizomycetes. [BACTERIA.]

Schizonemertea, an order of worms belonging to the class Nemertea, and characterised by the possession of a pair of deep longitudinal fissures, one on each side of the head. The two principal genera are *Lineus* and *Cerebratulus*. They are all marine. The Sea Long Worm (*Lineus longissimus*) is fourteen feet long and not more than from two to four lines broad.

Schizophyta, a term suggested for the Proto-phyta, a subdivision of the Thallophyta, comprising both algal or chlorophyll-containing forms (Schizophyceæ), and those without chlorophyll (Schizomycetes), in neither of which is there any sexual reproduction. Though some

are multicellular filaments, most are minute unicellular plants, and fusion is the sole method of multiplication. The algal forms are now, however, referred to the Cyanophyceæ as a division of the Algae, and the fungal ones to a division of Fungi under the name Schizomycetes.

Schizopoda, an order of Crustacea, comprising the family of Mysidæ or Opossum-shrimps. Their nearest allies are the Stomatopoda or Squills and the ordinary Decapoda or Crabs, Lobsters, etc. From the former group the Schizopods differ in the possession of a large "cephalothoracic shield" or plate covering the anterior end of the body. From the Crabs and Lobsters they differ in having the eight pairs of limbs on the thorax composed of two branches or rami. The members of the group are all marine. The Opossum-shrimps are frequently met with in countless myriads towards the surface of the Arctic Seas and, small though they be, they actually constitute the principal food of the Whalebone Whales (*Balaena mysticetus*) which accumulate a great quantity of fat or blubber. The obvious explanation of the sustenance of an animal of gigantic proportions on a diet apparently so inadequate is that it swallows hundreds of thousands of the Mysid at every mouthful, the prey being entangled in the bristle-like fringe with which the plates of baleen or whalebone are lined. And, of course, the whales also feed on other things, such as diatoms and small molluscs. Gampsonyx and some other Carboniferous genera may belong to this order, which is otherwise unknown as a fossil.

Schlagintweit-Sakünlinski, HERMANN VON, explorer, was born at Munich, Germany, on May 13th, 1826. He and his brother Adolph (who was born on January 9th, 1829) undertook a scientific study of the physical geography of the Alps, and, in 1854, four years after the publication of their book on the subject, they were commissioned by the East India Company to carry out similar investigations in Hindostan, with reference particularly to terrestrial magnetism. In this pursuit their brother Robert (born October 27th, 1837) was associated with them. They explored the Deccan, Himalaya, and other regions, Hermann and Robert being the first Europeans to cross the Kuenlun Mountains, in recognition of which feat the former acquired his cognomen of Sakünlinski. Adolph, who remained to conduct his inquiries in Central Asia, was murdered by the Ameer of Kashgar on August 26th, 1857. In this year his brothers returned home, and the four volumes containing an account of their researches appeared between 1860 and 1866. Hermann died at Munich on January 19th, 1882, Robert at Giessen, where he held the chair of Geography, on June 6th, 1885. Two other brothers achieved some distinction—Eduard (born March 23rd, 1831), who wrote an account of the Spanish expedition into Morocco in 1859-60, and was killed at the battle of Kis-

singen, on July 10th, 1866, and Emil (born July 7th, 1835), an expert in the tongues of India and Tibet, who was the author of *Die Könige von Tibet* (1865), *Die Gottesurteile der Inder* (1868), and other learned works.

Schlegel, AUGUST WILHELM, translator and critic, was born in Hanover, Germany, on September 8th, 1767, and educated at Hanover Gymnasium and Göttingen University. At Jena, where he held the chair of Literature and Fine Art, to which he had been appointed in 1798, he began his translation of Shakespeare's dramas, which was completed by Tieck and became the classical version in German. In 1803 he published his tragedy of *Ion*, and soon afterwards undertook translations of several of Calderon's plays, and Spanish, Portuguese, and Italian poems. In 1808 he delivered at Vienna a series of lectures on dramatic art and literature, which may yet be profitably studied. During many years he acted as secretary to Madame de Staël, and is said to have rendered her especial services in her work, *De l'Allemagne*, and in 1813 and 1814 he was secretary to Bernadotte, Crown Prince of Sweden. In 1818 he was appointed Professor of Literature in the University of Bonn, where he died on May 12th, 1845. During his latter years he devoted himself to Oriental literature, and was mainly instrumental, through his Latin translations of the *Bhagavad-Gita* (1823), and *Ramajana* (1829) and his study of Sanscrit, in preparing the way for the systematic cultivation of this language in the West. His uncle, Johann Elias Schlegel (1718-1849), was author of *Triumph der guten Frauen* and *Stumme Schönheit*, two comedies still in good repute, and of the excellent tragedies *Hermann* and *Kanut*.

Schlegel, KARL WILHELM FRIEDRICH, historian of literature, brother of August Wilhelm von Schlegel, was born at Hanover, Germany, on March 10th, 1772, and educated at Göttingen and Leipzig. He attracted attention by his book *Griechen und Römer* (1797), and especially by his novel of *Lucinde*, in which he enunciated free love opinions. At Jena he spent a few years lecturing in the university and contributing to the *Athenæum* articles on the Romantic movement, of which he was the leader in Germany, and in 1802 proceeded to Paris, where he pursued those studies which bore fruit in his valuable *Ueber die Sprache und Weisheit der Indier* in 1808. In this year he removed to Vienna, and was engaged in the Austrian public service, becoming for a period councillor of legation in the Austrian Embassy at the Diet of Frankfort. In 1811 he published his lectures, *Ueber die neuere Geschichte*, and, in 1815, *Geschichte der alten und neuer Literatur*, the latter one of his most useful works. He died at Dresden, on January 11th, 1829, whilst on a lecturing tour.

Schleicher, AUGUST, philologist, was born at Meiningen, Germany, on February 19th, 1821,

and educated at the Universities of Leipzig and Tübingen. He became professor of Slavonic philology at Prague in 1850, and in 1857 was appointed ordinary professor at Jena, where he died on December 6th, 1868. Among his best-known works are *Die Sprachen Europas* (1850), *Handbuch der litauischen Sprache* (1857), *Kompendium der vergleichenden Grammatik der Indogermanischen Sprachen* (1861), and *Indogermanische Chrestomathie* (1869).

Schleiermacher, FRIEDRICH ERNST DANIEL, theologian, was born at Breslau, Germany, on November 21st, 1768. He was sent to the Moravian school at Niesky, in Prussian Silesia, and afterwards to the Moravian seminary at Barby, in Prussian Saxony, but finding the extreme and narrow tenets of that body repugnant, his father at last, though reluctantly, allowed him to attend the University of Halle. Here he became imbued with a spirit of reverent criticism of the New Testament and a profound love of philosophy, especially for Plato and Aristotle among the ancients, and Kant among the moderns. Through his friendship with Karl Wilhelm Friedrich von Schlegel he took a keen interest in Romanticism, but his strong moral sense enabled him, not without a struggle, to escape the deteriorating influence of its baser elements. He was chaplain to the Charité Hospital in Berlin from 1796 to 1802, and produced his *Reden über die Religion* in 1799. During the two years he was at Stolpe, in Pomerania, he began his great translation of Plato, the first volume appearing in 1804, the last in 1828. In 1804 he became professor of theology at Halle, whence he removed, in 1807, to Berlin to assume the pastorate of the Trinity Chapel. When the University of Berlin was founded (1810), he was appointed to the chair of Theology, and henceforward, what with his preaching (which he seldom intermitted), his professorial duties, and his literary labours, led an extremely active life. To this period belongs his principal original book, *Der Christliche Glaube nach den Grundsätzen der evangelischen Kirche* (1821-2), the purport of which was to bring man into the most intimate relationship with his Maker, without the intervention of Church, or sect, or ecclesiastical routine. During the controversy to which this work gave rise he maintained his position with undiminished vigour, but his closing years were darkened by the death (1829) of his only son. He died in Berlin, whilst partaking of the Lord's Supper, on February 12th, 1854.

Schleswig-Holstein, a province of Prussia, Germany, formed out of the duchies of Schleswig, Holstein, and Lauenburg, which formerly belonged to Denmark, but in 1866 became incorporated in the kingdom of Prussia. It is bounded on the N. by Denmark, on the E. by the Baltic, on the S. and S.W. by Hanover, and on the W. by the North Sea. It includes Heligoland (Helgoland) and the North Frisian lands in the North Sea, and the islands of

Alsen and Fehmarn in the Baltic, and covers an area of 7,338 square miles. Schleswig constitutes the northern half, and Holstein and Lauenburg form the southern, the latter only a small district. The coasts are deeply indented. Most of the surface is a plain tract, but there are elevations of inconsiderable height in the east, whilst the western shore needs to be protected by dykes from the encroachments of the sea. The Eider, once the boundary between Schleswig and Holstein, is the principal river, and Lake Plön the largest lake. The raising of live-stock is a flourishing industry, the flocks and herds being extensive and horses and pigs being in great demand. Bee-keeping is also pursued. Good crops of grain and potatoes are yielded. The fisheries are important, and the western coast of Schleswig furnishes a favourite oyster, misnamed "Holstein natives." The industries are of secondary interest, but shipbuilding is carried on at Kiel, and the peasantry of Northern Schleswig are expert lace-makers. The province is traversed by the Kaiser Wilhelm Canal, extending from Kiel harbour to the estuary of the Elbe, and thus connecting the Baltic with the North Sea. In the 11th century Schleswig became a Danish possession, was united with Holstein in 1386, but a growing sense of German patriotism arose in the 19th century. The duchies of Schleswig and Holstein, as they were then, ineffectually tried to separate from Denmark in 1848-50 (the first Schleswig-Holstein War), but in the second war of 1864 Prussia and Austria wrested the duchies from Denmark, and in 1866 they were annexed to Prussia. The duchy of Lauenburg (area 446 square miles, pop. 51,833) became a part of the province in 1876. The capital is Schleswig (17,909), and Altona (161,501), Kiel (107,977) and Flensburg (48,922) are the leading towns. Pop. (1900), 1,387,968.

Schliemann, HEINRICH, explorer, was born at Neu Buckow, on the borders of Mecklenburg-Schwerin and Brandenburg, Germany, on January 6th, 1822. As a youth he became seized with an intense affection for the Homeric poems and, having amassed a fortune in business—partly as an indigo merchant in St. Petersburg, where he was established in 1846, and partly as a military contractor in the Crimean War—he was ultimately enabled to attempt to realise his life-dream, and discover the sites rendered memorable in the immortal epics of "the blind old man of Scio's rocky isle." Beginning in 1870 to excavate at Hissarlik, in the extreme north-west of Asia Minor, which he conjectured to be the site of the city of Troy, in three years he reached the remains not of this town but of a still older community. The customary rapacity of the Turkish Government now causing a suspension of his work here, he crossed to Greece, and was rewarded with the discovery at Mycenæ of invaluable relics of a civilisation still older than the Hellenic. He resumed his exploration at Hissarlik in 1879,

and carried on research work at Orchomenos, Tiryns, Alexandria, and Crete, always bringing to light some fresh facts of incomparable interest to classical and pre-classical antiquity.



POTTERY, STONE HAMMER AND AXE-HEADS FOUND ON THE SITE OF TROY
BY DR. SCHLIEHMANN.

He died at Naples on Christmas Day, 1890. Among the books in which he recounted the history of his various explorations may be mentioned *Ithaka, der Peloponnes, und Troja* (1869), *Trojanische Alterthümer* (1874), *Mykenæ* (1877), *Ilios* (1880), *Troja* (1883), and *Tiryns* (1886).

Schmalkalden, or SMALKALD, a town of the province of Hesse-Nassau, Prussia, at the junction of the Schmalkalde and the Stille, 12 miles N. of Meiningen. It contains several picturesque old buildings, such as the town hall, church, and castle, besides a monument to Karl Wilhelm, the composer of "Die Wacht am Rhein," who was born here on September 5th, 1815, and died here on August 26th, 1875. There are manufactures of hardware and iron-mining. Historically the town is famous as the place where the League of Schmalkalden was drawn up, in which the Protestant princes and Imperial cities agreed to make common cause for the Reformed faith against Charles V. and the Roman Catholic States. The tavern in which the alliance was concluded in 1531, and the house in which Martin Luther, Philip Melancthon, and other leaders drew up the Articles of Schmalkalden in 1537 still exist. Pop. (1900), 8,720.

Schmits, LEONHARD, educationist and historian, was born at Eupen, in Rhenish Prussia, on March 6th, 1807, and educated at the gymnasium of Aachen and the University of Bonn. In youth an accident cost him his right arm, but by dint of perseverance he managed to write an excellent script with his left hand. Coming to England in 1837 he acquired letters of naturalisation, and in 1845 was appointed

Rector of the Royal High School of Edinburgh. In 1859 the Prince of Wales (afterwards Edward VII.) came to him for private tuition, as also did the Duke of Edinburgh in 1862-3, and the sons of the Duc d'Aumale, the Prince de Joinville, and the Duc de Nemours were amongst his pupils at the High School. From 1866 to 1874 he was Principal of the International College at Isleworth, Middlesex, and afterwards officiated as classical examiner to the University of London. He died in London on May 28th, 1890. He was LL.D. of Aberdeen (1849) and Edinburgh (1886), and among his works should be mentioned his translations of the third volume of Niebuhr's *History of Rome* (1842) and of Niebuhr's *Lectures on the History of Rome* (1844), based on his own notes while a student, which led to the authorised German edition, and gained the King of Prussia's gold medal for literature and science. From 1843 to 1849 he conducted the *Classical Museum*, and was

a constant contributor to Dr. (afterwards Sir) William Smith's well-known classical dictionaries. His *Latin Grammar* (founded on that of Karl Zumpt) and his *History of Rome* (1847) were his best school-books.

Schnitzer, EDUARD (EMIN PASHA), traveller, was born at Oppeln, in Prussian Silesia, on March 28th, 1840, and educated as a doctor at the universities of Breslau, Berlin, and Königsberg. He proceeded to Turkey to practise, and adopted an Eastern name and habits, embracing, it is believed, the Musulman faith. In 1876 he entered the Egyptian medical service, was sent to Khartum, and appointed by General Gordon chief medical officer—but really with full political power—in the Equatorial Province (1878), with the title of Bey. Soon after the outbreak of the Mahdists he was completely cut off from civilisation, but (having meanwhile been promoted to the rank of Pasha) managed to withdraw from Lado to Wadelai. He seems to have held his own, and apparently had neither the wish nor was under



EDUARD SCHNITZER
(EMIN PASHA).

the necessity of being relieved. However that may be, Sir H. M. Stanley "discovered" him in 1888, and Emin ultimately accompanied the expedition to Zanzibar, which was reached in December, 1889. After recovering from a serious accident, he undertook an expedition in German interests in Central Africa, but had to encounter all manner of obstacles—dissensions with different authorities, epidemics in his force, and personal illness—and, finally, was murdered in the Congo Free State by an Arab slave-dealer on October 23rd, 1892.

Schnorr von Carolsfeld, JULIUS, painter, was born at Leipzig, Saxony, on March 26th, 1794, and entered the Academy of Vienna at the age of seventeen. He acquired skill as a fresco-painter, and executed some designs in Rome in illustration of Ariosto. In 1825 he settled at Munich under the patronage of King Ludwig of Bavaria, whose palace he adorned with frescoes, the subjects of which were taken from the *Nibelungenlied*. Later in his career he spent several years in illustrating the Bible, his designs for which, amounting to 180, were at one time familiar through engravings in every well-to-do household. Schnorr had some reputation as a designer of stained-glass windows, and examples of his work in this line may be seen in St. Paul's Cathedral, London, and the Cathedral of Glasgow. He died at Dresden on May 24th, 1872.

Scholasticism, the philosophy of the Middle Ages, grew out of the endeavour to reconcile man's innate tendency to speculation with the demands made upon his faith by the Church. John Scotus Erigena (flourished in the 9th century) may be regarded as in some respects a forerunner of the schoolmen; but he cannot properly be reckoned among them, as his works have only an indirect bearing on the problems with which they were chiefly occupied. The great discussion which throughout the Middle Ages divided the schoolmen into two hostile camps was that concerning the real existence of the entities corresponding to abstract names. The Realists held that all genera and species exist as intelligible forms apart from their manifestation in this or that individual, whereas the Nominalists believed the sole source of general notions to be abstraction from particulars. The dispute was in great measure due to a confusion between names and things, which could not have persisted so long if men's minds had not been cramped by the exclusive study of the Aristotelian logic, whilst at the same time the authority of the Church prevented them from taking a free view of the universe and their own natures. The Renaissance and the Reformation were at once the symptoms and the causes of a new order of convictions; men now felt that the capabilities of the mind transcended the limits imposed upon it by tradition. They were seized with an eager desire to probe the secrets of Nature, and, wherever these ideas prevailed, the whole fabric of Scholasticism speedily

crumbled away. Roscellinus (b. circa 1050) is held to be the founder of Nominalism, whilst Anselm (1033-1109), Archbishop of Canterbury, was the first who came forward to defend the Realism implicitly involved in the doctrines of the Church. Peter Abelard, the disciple of Roscellinus, carried his speculations much farther than his master, thereby earning for himself many bitter years of persecution. The attempt to reconcile the discrepancies between the Fathers, which had been too clearly pointed out by Anselm, was undertaken with but imperfect success by his pupil Peter Lombard (d. 1160). Early in the 13th century the metaphysical and ethical writings of Aristotle became known to the western world through the Arabian philosophers Avicenna (980-1037) and Averrhoes (1126-1198), and from that time the discussions of the schoolmen were carried forward on a wider basis. Albertus Magnus (1193-1280) was the first who undertook the perilous task of reconciling the teaching of Aristotle with the doctrines of the Church. He was followed by Thomas Aquinas (1226-1274), author of the famous *Summa Theologica*, in which he endeavoured to show that faith and reason may be regarded as independent sources of knowledge in their respective spheres. He was opposed by Duns Scotus (circa 1265-1308), who holds a similar place among the Franciscan doctors to that which belongs to Aquinas among the Dominicans. The dispute between the two gave rise to the rival schools of Thomists and Scotists. Roger Bacon (1214-94) belonged to the Franciscan order, but he was far in advance of his age, and seems actually to have made use of inductive methods. The last of the great schoolmen was William of Ockham (circa 1270-1349), a pupil of Duns Scotus, who carried Nominalism to its logical result, and thus undermined the whole scholastic system.

Schomberg, or SCHÖNBERG, FRIEDRICH HERMAN, DUKE OF SCHOMBERG, general, was born at Heidelberg, Germany, in December, 1615. He lost both parents before he was a year old and was educated privately and at the Academy of Sedan and the University of Leyden. He took to a military career and saw service in most countries in Europe. In France his reputation stood almost as high as that of Marshal Turenne and the Prince of Condé. While Charles II. was on the Continent during the Protectorate, Schomberg made his acquaintance, and in 1673 Charles, but for the fear of being taunted with yielding to French influence, would have summoned him to England to take over the army. He *did* come to England with the Prince of Orange on November 5th, 1688, and next year he was made Knight of the Garter, created a duke, and voted £100,000 to recompense him for the loss of his estates in France, forfeited to Louis XIV. when he learned of Schomberg's support of William III. In May, 1689, he gave the peremptory order that led to the relief of Londonderry, and, as commander-in-chief of

the forces in Ireland, proceeded to place the country in a state of defence and organise victory. He was surrounded whilst crossing the Boyne during the battle of July 1st, 1690, and instantaneously killed. He was buried in St. Patrick's Cathedral, Dublin.

Schomburgk, SIR ROBERT HERMANN, explorer, was born at Freiberg, in Saxony, on June 5th, 1804, and educated in Germany. His taste for natural history incited him to travel. He explored the rivers Essequibo, Corentyn and Berbice, and exhaustively examined the potentiality for settlement and commerce of British Guiana. He discovered and sent to England the magnificent lily, *Victoria Regia*. From 1841 to 1843 he was engaged in delimiting the boundary of British Guiana and established the "Schomburgk line," of which so much was heard in 1895-6, during the boundary dispute between Great Britain and Venezuela. On his return to England in 1844 he received the honour of knighthood. In 1848 he was appointed British Consul in St. Domingo, and in 1857 at Bangkok. His health failing he retired from the service, and died in Berlin on March 11th, 1885.

Schönbrunn, an imperial palace in the southwestern suburbs of Vienna, Austria. It was erected by Maria Theresa in 1744, and the peace between France and Austria was signed within its walls on October 14th, 1809. It is famed for its beautiful park, which contains both a zoological and a botanical garden.

Schoolcraft, HENRY ROWE, explorer, was born in Albany county, New York State, United States, on March 28th, 1793. He studied chemistry and mineralogy, and for a few years was engaged in his father's glass-factory. In 1818 he was appointed to the Geological Survey of Missouri and Arkansas and afterwards accompanied General Cass as geologist to the Lake Superior copper mines. Evincing so much aptitude for frontier work he became "Agent for Indian Affairs" in 1823 and, marrying the granddaughter of an Indian chief, he acquired in time an intimate knowledge of the manners, customs and language of several tribes of the red men, about whom he published several works, the most important of which—a classic and invaluable—was *Historical and Statistical Information respecting the Indian Tribes of the United States*, published between 1851 and 1857. It was illustrated with 336 plates after original drawings and was issued under the patronage of Congress. The author died at Washington on December 10th, 1864.

Schools, BROTHERS OF CHRISTIAN, a congregation in the Roman Catholic Church, composed of lay-brothers who devote their lives to the instruction of the poor, after receiving a preliminary training in the normal schools of the order. The society was set on foot by the Abbé de la Salle, who in 1684 resigned his canonry at Rheims in order to give himself

wholly to this work. The schools are now doing a good work not only in France, Italy and the south of Germany, but also in other parts of Europe, and in North America and Africa. The Institute of Irish Christian Brothers was founded in 1802 by a wealthy and enlightened provision merchant of Waterford named Edmund Ignatius Rice (1762-1844). The excellent work which it was doing amongst poor children induced other men to support it, and in other towns Rice's example was followed. In 1820 Pius VII. officially recognised the order under the title of the Religious Brothers of the Christian Schools (Ireland). The number of pupils attending the primary and other schools of the order exceeds 40,000. The methods of teaching have been highly commended by various royal commissions.

Schooner, a small but swift vessel, of sharp build, which commonly has two masts, but sometimes three, and even four or five. A fore-and-aft schooner has fore- and aft-sails only, whereas a topsail schooner carries a square topsail and top-gallant-sail. The latter rig is now seldom seen but in trading vessels.

Schopenhauer, ARTHUR, philosopher, was the son of a banker, and was born at Danzig, Prussia, on February 22nd, 1788. His mother, a well-known

authoress, was acquainted with most of the great writers of the time, who visited her house, and in that way the future philosopher had early and exceptional opportunities of cultivating his intellect. His precocity was the subject of remark, and his



ARTHUR SCHOPENHAUER.

peculiar contempt for humanity seems to have been developed whilst he was a boy. In 1809 he entered Göttingen University, afterwards attending the lectures of Fichte in Berlin, and travelling in England and France. He became very fond of English and French literature, and expressed some scorn for that of Germany and for his countrymen. In 1813 he had graduated at Jena, and, after much restless journeying, settled in Frankfurt-on-the-Main, possessing sufficient means to gratify his whims. He pursued his studies closely, and lived the life of a recluse. He had a strong feeling of admiration for Oriental ideas, and enthusiastically praised Buddha. His principal work is that entitled *Die Welt als Wille und Vorstellung* ("The

World as Will and Idea"), which came out in 1819, and was very coldly received, a fact which did not tend to dissipate his contemptuous views of human nature. He was very ill-tempered, and had a profound disbelief in the goodness or intelligence of women. (From 1814 till her death in 1838 Schopenhauer never set eyes on his mother.) Slowly but surely he attracted some admirers of his philosophy, and a second edition of his work appeared in 1844. His philosophy is partly based on that of Kant; but the Will (= force), rather than the Idea, was the mainspring of his system. He held that human nature was as evil as it well could be. His style is excellent, and an English translation of his chief work appeared in 1886. He died at Frankfort-on-the-Main on September 21st, 1860.

Schreiner, OLIVE (MRS. CRONWRIGHT-SCHREINER), a gifted South African writer, who made a great reputation by her *Story of an African Farm* (1883), partly because of the author's strong and nervous style, partly because of the book's unexpected revelation of profundity of thought and poignant human interest experienced amidst the silence and immensities of the illimitable veldt. Others of her works are *Dream Life and Real Life* (1893), *Trooper Peter*



OLIVE SCHREINER.
(Photo: Elliott & Fry, Baker St., W.)

Halket (1897), *An English South African's View of the Situation* (1899), and, in collaboration with her husband, *The Political Situation* (1895). She was very strongly opposed to the war between Great Britain and the Boers (1899-1902), and did all in her power to prevent hostilities. Soon after the outbreak of the war, she was subjected to military surveillance. In 1894 she married Mr. S. C. Cronwright and, along with him, visited England with a view to addressing public meetings, but was refused a hearing.

Schreiner, Rt. Hon. W. P., politician and lawyer, was born in Cape Colony, South Africa, in 1857. He was educated at the Cape University, London University and Downing College, Cambridge. He was Attorney-General in Cecil Rhodes's Ministry in 1893. He parted company with that statesman, however, after the Jameson Raid, and in 1898 defeated Sir G. Sprigg's Government and became Premier with the support of the Afrikaner

Bond. During 1899 and 1900, when the Boer war was being waged, his position was one of great difficulty, and though charged by some with disloyalty, it was more generally felt that he acted throughout with steadfast patriotism. He resigned in 1900.

Schubart, CHRISTIAN FRIEDRICH DANIEL, poet and musician, was born at Obersonthem, Swabia, Germany, on March 24th, 1739, and was educated at Nördlingen and Nuremberg, and, in 1758, studied theology at Erlangen. He became a teacher at Geisslingen in 1763, and six years later organist and choir-master at Ludwigsburg. Losing this position in consequence of his frivolity, he wandered from town to town until he settled at Augsburg, where, from 1774 to 1777, he produced his *Deutsche Chronik* and gave a series of public readings of his own compositions, which were received with great applause. His unruly tongue and pen, however, landed him in more trouble, and he languished in prison for ten years. He was released in 1787 by the intervention of the King of Prussia, and became musical director of the theatre at Stuttgart, where he died on October 10th, 1791. A collected edition of his works appeared shortly before his death.

Schubart von Kleefteld, JOHANN CHRISTIAN, agriculturist, was born at Zeitz, in Prussian Saxony, on February 24th, 1734. He began life by undertaking commissariat contracts for the British army in Berlin, and he was afterwards engaged in a similar capacity in the Seven Years' War. He next travelled throughout Europe for the Freemasons in 1767 and, having amassed a fortune, purchased an estate at Zeitz, where he turned his attention to agriculture. He introduced the cultivation of clover, tobacco and madder on a commercial scale. He was ennobled for his services in 1784 and died on April 23rd, 1787. He recounted his observations and experiences in his *Oekonomisch Kameralistischen Schriften* (1783-4) and *Oekonomischer Briefwechsel* (1786).

Schubert, FRANZ PETER, one of the greatest of musicians, was born in Vienna, on January 31st, 1797, of a musical family, and at the age of seven was a pupil of Michael Holzer. His family did not desire him to become a professional musician, having the impression that he would do better in some other walk of life. His remarkable genius was so soon manifested that he composed some beautiful pieces while almost an infant, and his excellent voice procured him admission to the choir of the Imperial Chapel. His father was a humble schoolmaster and gave him a fairly good education, and, to his disappointment, he was obliged to assist him in the tuition of the school, thus interrupting rather seriously his musical studies. He was enabled to take lessons from Salieri, and after a time began to teach pupils himself as a means of livelihood. He was at this time, as all through his later career, a

most voluminous—in literal truth, a marvelous—composer, attempting every branch of the art, and completing sonatas, operas, masses, overtures, symphonies, and cantatas. His first



FRANZ SCHUBERT.

mass in E flat, which was found among the enormous quantity of MSS. he left behind him, is a magnificent work. He was a great admirer of Beethoven, and felt something like reverence for that master. Beethoven recognised his genius also, being one of the few who did so during Schubert's life. He was

much disappointed at the lack of appreciation of his earlier operas and other ambitious works, and died in Vienna, where he had mostly lived, of a fever on October 13th, 1828. It is curious, seeing his notable feeling for Beethoven's music, that there is so little sign of the latter's influence in his works. He was a most strikingly original composer, and was perhaps at his best as a song-writer. His songs, which number about six hundred, are often perfect, and give the highest expression known to music of the sense of harmony and melody. It has often been regretted that his early masters did not more strictly supervise his budding genius, as otherwise there can be no doubt that he would have done work as memorable in other branches as in that of the lyric; but his teachers used to exclaim that his powers were so astonishing that they could not teach him anything. He set 67 of Goethe's and 54 of Schiller's songs to music. Robert Schumann said of him that he could have set a placard to music, and Vogl described his glorious lyrics as "divine inspirations—utterances of a musical clairvoyance." Despite his marvellous gifts, Schubert had much difficulty in inducing the publishers to take his compositions, and when he died he left a tremendous mass of MSS. to his brother, which his friends and admirers proceeded to get published as speedily as possible. Schubert was buried near Beethoven in the Ortsfriedhof, Vienna, but his remains were re-interred in the Central Cemetery in 1888. Liszt did a great deal to spread a knowledge of Schubert's genius, and was a passionate admirer of his works. But now Schubert has entered into his kingdom, where he reigns supreme as the rarest and most versatile songwriter the world has ever known.

Schulze-Delitzsch, HERMANN, economist and politician, was born at Delitzsch, in Prussian Saxony, on August 29th, 1808, and studied law at Leipzig and Halle. After holding legal offices at Naumburg and Berlin, he became, in 1841, head of the manorial court of justice in his native town. Having been elected to the National Assembly at Berlin in 1848, he took a keen interest in the inquiry into the prevalent distress, and soon afterwards founded a people's bank, where subscriptions of small sums were received and through which members were entitled to borrow money. We have been so long familiar with the principle, which has been extended to building societies and other organisations besides banks for the small lender and borrower, that it is easy to realise the importance of the movement initiated by Schulze, which speedily spread throughout Germany and to the adjoining countries. Having seen his reform securely established he again took an active interest in politics, and was a member of the Reichstag, representing Berlin from 1867 to 1874 and Wiesbaden from 1874 till his death, which took place at Potsdam on April 29th, 1883. Amongst his works should be named *Associationsbuch für deutsche Handwerker und Arbeiter* (1853) and *Vorschuss- und Kreditvereine als Volksbanken* (1876). It is curious that so recently as 1850 a public man like Schulze should have had to stand his trial for daring to enunciate the maxim, now commonplace in every constitutional country, that representation and taxation should go together.

Schumann, ROBERT ALEXANDER, composer and critic, was born at Zwickau, in Saxony, on June 8th,

1810, and in 1829 entered Leipzig University. Intended for the law, but with a strong predilection for musical studies, he finally gave himself up to his favourite art and began to practise the piano-forte under Friedrich Wieck and composition under Heinrich Dorn, composing a



ROBERT SCHUMANN.

little and editing *Die neue Zeitschrift für Musik*, a musical journal which he founded in 1834, and to which he contributed much valuable and profound criticism. His leading compositions of this period are his *Études Symphoniques*,

Kreiseriana, and other pieces less known. In 1840 he married Clara, the daughter of his teacher Wieck, and she did much to extend his fame by her perfect interpretation of his works. The same year saw his admission to the degree of doctor of philosophy at Jena University, and he then turned his attention to lyrical pieces, in which probably only Beethoven and Schubert surpassed him. He set most of Heine's songs to music. In 1843 he produced at Leipzig his choral works, *Paradise and the Peri* and a version of *Faust*. He also composed for the orchestra, and brought out some very beautiful symphonies and other chamber-music. In 1843 he was appointed Professor of Composition in the Conservatorium at Leipzig and in 1848 wrote his only opera, *Genovera*. In 1850 he became musical director at Düsseldorf, a position which Mendelssohn had occupied with distinction, which he held for three years. He had



CLARA SCHUMANN.

been for many years suffering from mental disease, and on one occasion, whilst a young man, attempted to commit suicide. In 1854 he again tried to kill himself, and two years later (July 25th, 1856) died in a private asylum at Enderich, near Bonn. At first he was somewhat derided, but later opinion has placed him on one of the highest pinnacles of modern musical genius. His compositions are often most entrancing, and there is no question now of his place in musical history. His works are becoming more and more popular in England as people are given more opportunities of judging. His wife, CLARA JOSEPHINE WIECK, was born at Leipzig on September 13th, 1819, and was taught the piano by her father. Her remarkable executive gifts were early manifested, and by 1832 she took her place with the most accomplished interpreters of the classical school. After her marriage (which was not favoured by her own people) she set herself to render in public her husband's music, a task

which became to her imperative after his death. She paid her first visit to England in 1856. Her wonderful capacity was immediately evident, yet her particular mission, owing to the hostility, insularity and ignorance of the critics, yielded only negative results. But time was on her side and though she was not in a hurry to repeat her trip, when she did come (in 1865) it was to enjoy a veritable triumph. She died at Frankfort-on-the-Main on May 20th, 1896. She was a composer of no mean order.

Schuyler, PHILIP JOHN, soldier and statesman, was born at Albany, New York State, United States, on November 22nd, 1733, and educated at New Rochelle. He entered the army and took part in the battle of Lake George in 1755. After the peace of 1763 he developed his estate in various ways, sending timber down the Hudson from Saratoga and erecting the first flax mill in North America. He never ceased his interest in public affairs, however, became member for Albany in the Colonial Assembly in 1768, and was author of the proposal for appointing Edmund Burke agent in England for the Colony of New York (1770). When war with the Mother Country grew inevitable Schuyler was assigned the command of the northern department of New York, but weak health, not unaggravated by petty jealousies on the part of the chief officers of the staff, led him to transfer his field command to General Richard Montgomery. He now took charge of the commissariat and recruiting, but here, too, he was so greatly hampered by the conduct of General Horatio Gates (who ignored his command) that he tendered his resignation to Congress, which was not accepted. In 1777 he was elected to represent New York in the Continental Congress, by which his conduct was completely vindicated, as it was also by the court-martial summoned in 1778 to consider the whole situation. Schuyler had had enough of it, however, and resigned definitely next year. He took a prominent part in the dealings with the natives and had acted as Indian Commissioner for several years. From 1780 to 1784, from 1786 to 1790, and from 1792 to 1797 he was State Senator for the western district of New York; while from 1788 to 1791 and from 1797 to 1798 he was a senator of New York City. In State politics he was a federalist and went solid for the Union. He was the promoter of the canal system of his native state and one of the founders of Union College. He died at Albany on November 18th, 1804.

Schwartz, CHRISTIAN FRIEDRICH, missionary, was born at Sonnenburg, in Brandenburg, Prussia, on October 22nd, 1726, and educated at Sonnenburg, Küstrin and the University of Halle, where he studied for the Church. Becoming interested in the Danish Mission at Tranquebar in South India, he determined to take part in it, and was ordained at Copenhagen in 1749. Next year he landed at Tran-

quebar and soon acquired facility not only in Tamil (the local language), but also in Hindustani, Persian and Mahratta, which he spoke as fluently as he spoke German, English and Portuguese. For twelve years he laboured zealously in church and school, his unostentatious piety and unselfish life greatly impressing the natives. In 1762, during a visit to Trichinopoly he agreed to take over the mission station there and act as chaplain to the British troops as soon as a church was provided. Christ Church was dedicated in 1766 and thither Schwartz removed in that year. Here he remained till 1778, when he went to Tanjore, with whose Rajah he had become friendly. Soon afterwards he undertook a secret mission to Hyder Ali, who received him graciously at Seringapatam. This experience proved useful a little later, for when Hyder overran the country and threatened Madras, Schwartz was permitted to move freely in and out to tend the wounded, sick and dying. "He is a holy man," said Hyder, "and means no harm to my government." He next prepared a scheme of Government schools for Tanjore, and was instrumental in founding the largest native church in Tinnevely. He was appointed Governor of Serfojee, and when a cousin of the Rajah, who had adopted him as his heir, was set aside by the dead Rajah's brother, Schwartz successfully appealed to Government for a hearing of the lad's claim, which was settled in the youth's favour. Schwartz died at Tanjore on February 13th, 1798.

Schwarzburg-Rudolstadt, a principality of Thuringia, Germany, consisting of the upper lordship, situated among the Saxon duchies, and the lower lordship in the south of Prussian Saxony. It occupies an area of 363 square miles. The scenery of the Forest is extremely attractive. The surface is hilly, the highest point being 2,850 feet above the sea. The Saale, Ilm and Schwarz are the principal streams. Agriculture is the chief industry, the leading crops being potatoes, rye, oats and barley. For a small territory the raising of live-stock is vigorously carried on. The minerals include iron, copper, salt, cobalt, alum and lignite. The manufactures, which are comparatively insignificant, comprise textiles, iron-ware, glass and porcelain. The principality sends one member to the Bundesrat and one deputy to the Reichstag. The Schwarzburg-Rudolstadt line is a younger branch of the house of Schwarzburg, being descended from Albrecht VI., 1605, who died in the middle of the 17th century. Rudolstadt (12,405) is the capital. Pop. (1900), 93,059, nearly all Protestants.

Schwarzburg-Sonderhausen, a principality of Thuringia, Germany, comprising the upper lordship in two detached portions surrounded by the Saxon duchies of Gotha, Weimar and Meiningen, and the lower lordship in the south-west of Prussian Saxony. It occupies an area of 333 square miles. The surface is moun-

tainous, part of the forest uplands reaching a height of nearly 3,000 feet. The Wipper, Helbe and Gera are the chief rivers. The principal crops are potatoes, oats, barley, wheat and rye; fruit is extensively cultivated, and the raising of live-stock is vigorously pursued. Salt is the only mineral of any consequence. The manufactures are necessarily conducted on a small scale, and include machinery, porcelain, glass, leather, shoes, gloves, beet-sugar and hardware. The principality sends one member to the Bundesrat and one deputy to the Reichstag. The chief towns are Sonderhausen (7,054) in the lower, and Arnstadt (14,421) in the upper lordship. Pop. (1900) 80,898, almost entirely Protestants.

Schwarzenberg, KARL PHILIPP, PRINCE VON, field-marshal, descended from a noble family, was born at Vienna on April 15th, 1771. He served in the Turkish War of 1789 and during the wars against the French Republic, especially distinguishing himself by his intrepid cavalry charge at the battle of Cateau-Cambrésis in 1794. He was promoted to the rank of field-marshal in 1799. He fought at Hohenlinden (1800), and at Ulm (1805) cut his way through the French army, and showed great bravery at Wagram in 1809. In 1812 he was sent with a large Austrian contingent to the aid of Napoleon's invasion of Russia, but in 1813 was entrusted with the supreme command of the Allied Forces and gained the great victories of Dresden and Leipzig. He died at Leipzig on October 15th, 1820. He was somewhat of *persona grata* to Napoleon, for whom he conducted the negotiations terminating in the marriage with Maria Louisa.

Schwarzwald. [BLACK FOREST.]

Schweidnitz, a town of Prussian Silesia, Germany, on the left bank of the Weistritz, 30 miles S.W. of Breslau. It is a well-built town, the old fortifications being now laid down in promenades. The surrounding country yields flax, hemp, sugar-beetroot, cereals and fruit, in which products a brisk trade is done. The manufactures include textiles, machinery, agricultural implements, hosiery, carpets, millstones, tools and hardware. Schweidnitz beer is famous. In 1278 it became the capital of a principality which then belonged to Bohemia, but was transferred to Prussia in 1741. It suffered severely during the Seven Years' War. Pop. (1900), 28,432.

Schweinfurt, a town of Lower Franconia, Bavaria, on the right bank of the Main, 22 miles N.N.E. of Würzburg. The principal buildings are the Renaissance Town Hall, the Gymnasium founded by Gustavus Adolphus in 1631 (the new school dates from 1881), the Commercial Institute, the Technical School, and the Gothic Church of St. John. The industries include bell-founding, cotton-spinning, and brewing, besides manufactures of paint ("Schweinfurt green" being noted in Germany), soap, paper, steel shot, bicycle bear-

ings, flour, shoes, machinery, and sugar. A statue has been erected to Friedrich Rückert, the poet, who was born here in 1788. It was a free Imperial city from the 13th to the beginning of the 19th century, when it was assigned to Bavaria. In 1810 it was transferred to the Grand Duke of Würzburg, but four years later it was restored to Bavaria. Gustavus Adolphus occupied it in the Thirty Years' War. Pop. (1900), 15,295.

Schweinfurth, GEORG AUGUST, traveller, was born at Riga, in Russia, on December 29th, 1836, and was educated at Heidelberg, Munich and Berlin, of the last named of which he became a doctor of philosophy. He went to the Soudan in 1863, traversed the Nile valley as far as Khartoum, and made some botanical discoveries. On a second expedition (1869) he found the river Welle, a tributary of the Congo, and now called the Aruwimi. His valuable work, *Im Herzen von Afrika* (1874), records many interesting and important facts. He strongly opposed the extension of British influence in the Nile valley. In 1880 he was appointed director of the Natural History Museum at Cairo.

Schwenkfeld, GASPAR VON, Reformer, was born at Ossing, in Prussian Silesia, in 1490, and was educated at Cologne and other universities. He first became a priest, but, agreeing with Luther as to main questions, he accepted the principles of the Reformation, though he strongly objected to Luther's moderation and lack of enthusiasm. He was himself of excellent character, but a fanatic, and openly quarrelled with Luther in 1525, and was banished from Silesia. He made many disciples, and founded a sect of his own, which spread very widely. He thought the Scriptures were always, and would be always, wrongly interpreted. He was for a time an Anabaptist, but finally denied the inspiration of the Bible. His piety and sincerity were never questioned by any of his contemporaries except Melancthon. He died at Ulm on December 10th, 1561.

Schwerin, capital of the Grand Duchy of Mecklenburg-Schwerin, on the south-western shore of Lake Schwerin, 112 miles N.W. of Berlin and 20 miles S. of the Baltic coast. Its situation is attractive and the environs are charming. The principal structures include the Grand Ducal Palace, built in 1844-57 in the French Renaissance, the Old Palace, the Grand Ducal Library, the Government Buildings, the Museum, the Town House, and the 13th-century cathedral. There are manufactures of furniture, carriages, dyes, musical instruments, machinery, and cloth. The town was founded in 1161 by Henry the Lion in opposition to the old Wendish fortress. Owing to a series of destructive fires and the hardships inflicted on it by the Thirty Years' War, it declined until the accession of the Grand Duke Paul Friedrich (1837-42), under whose enlight-

ened rule its prosperity revived. Pop. (1900), 38,672.

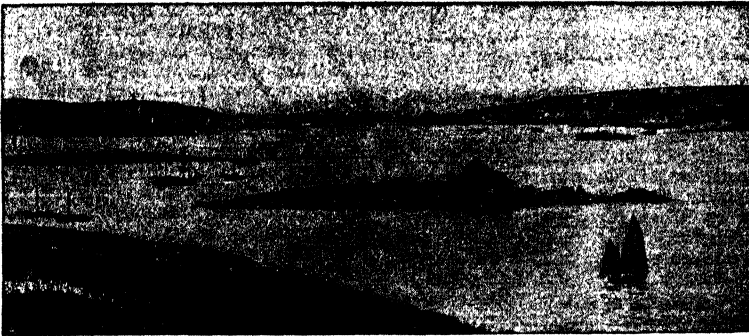
Schwyz, a forest canton of Switzerland, bounded on the N. by the Lake of Zürich, on the N.E. by St. Gall, on the E. by Glarus, on the S. by Uri, on the W. by the Lake of Lucerne and Lake Zug, and on the N.W. by Zug. It occupies an area of 351 square miles. The surface is mountainous and includes the peaks of Böse Faulen (9,200 feet) and Rigi Kulm (5,905 feet). The chief streams are the Sihl and Muota. Cattle, swine, goats and sheep are raised, and the industries include cotton-spinning and silk-weaving, besides pottery and the making of straw goods. Fruit is cultivated on a considerable scale. The largest towns are Einsiedeln (8,496), the seat of a celebrated abbey, and Schwyz (7,398) the capital. In 1291 Schwyz, along with Uri and Unterwalden, combined against the house of Hapsburg, this league constituting the nucleus of the Confederation. The Austrian invasion in 1315 was repelled in the pass of Morgarten. Since Schwyz played always the foremost part in such struggles for freedom, foreigners at last came to apply its name to the league, from which it was easily and naturally extended to the whole territory of Switzerland. Pop. (1904), 56,901.

Sciatica, pain in the course of the great sciatic nerve, which runs at the back of the thigh, and thence down the leg to the foot. The pain is neuralgic in character, and is aggravated by pressure, particularly when such pressure is applied in certain situations, and even by such apparently trifling causes as movement of the limb, stooping, or sneezing. Sitting is sometimes impossible. The disease is frequently brought on by exposure to cold, over-walking and strains, or may be associated with gout, malaria, and with rheumatic conditions. It is often very intractable, but sometimes yields to counter-irritation and the administration of appropriate remedies internally. In the more obstinate cases electricity is of service, and acupuncture has been resorted to with beneficial results, while it may even be necessary to adopt the heroic method of nerve-stretching to procure relief from the exquisite and intolerable pain. In the latter operation the nerve-trunk is cut down upon and the nerve is then pulled strongly. In milder attacks it may suffice to keep the patient in bed and apply hot fomentations, linseed poultices, or blisters. A liniment of belladonna and chloroform sprinkled on spongiopiline and laid along the course of the nerve may relieve the pain and cure the neuralgia. Possible constitutional causes should always be sought for and treated with appropriate remedies, such as colchicum for gout, quinine for ague, iron for anæmia, and salicylate of soda for rheumatism.

Scilly Islands, a group of islands at the western entrance to the English Channel, 25 miles W. by S. of Land's End and 40 miles W.

of Lizard Point, Cornwall. They consist of five inhabited islands—namely, St. Mary's (1,500 acres), Treseo (700 acres), St. Martin's (550 acres), St. Agnes (350 acres), and Bryher (300 acres)—and about 140 islets of greater or less

Civil War they stood out for the king and were strongly fortified in 1649 by Sir John Grenville, who swept the Channel from this coign of vantage and played such havoc with the shipping that at last Parliament ordered a



SCILLY ISLANDS: GENERAL VIEW OF ST. MARY'S.

(Photo: C. J. King.)

extent, and occupy a total area of 3,560 acres. They are wholly composed of granite and, by the action of rain and sea, their rocky surface has been hollowed out into huge basins or carved into various fantastic forms. Though there are few trees the scenery has a charm of its own and the climate is so mild as to admit of a semi-tropical vegetation and is also the mainspring of the leading industry of the islanders. This is the raising of narcissus and other flowers, as well as asparagus, early potatoes and vegetables. Fuchsias, myrtle, geraniums and other plants grow to a remarkable size, and aloe, cactus and the prickly pear flourish in the open, while the rhea, or South American ostrich, has taken quite kindly to the climate of Treseo. Some fishing is carried on, and there is a lucrative catch of lobsters. At times seals put in an appearance, and the cliffs and rocks are covered with sea-fowl. Hugh Town, on the west side of St. Mary's, is the capital of the group. Half a mile to the west of the town stands Star Castle, a granite structure dating from the reign of Elizabeth, which derives its name from the circumstance that the fortifications project in eight salient angles. Charles II. found shelter here in 1646, when he was Prince of Wales, till he escaped to Jersey, and it was the prison, in 1637, of Dr. Bastwick, deported hither by the Star Chamber for writing scurrilously of the bishops. Treseo is the most beautiful of the islands and contains the residence of the proprietor. The islands are probably the Cassiterides, or Tin Islands, of the Greeks and the Siluræ Insulæ of the Romans. In 936 Athelstan granted them to monks who had settled in Treseo, but they were bestowed at a later date on Tavistock Abbey as a portion of its endowment. In the

fleet, under Admiral Blake and Sir George Ayscue, to besiege them, and the gallant Royalist was compelled to surrender in 1651. During the free-trading period the isles were haunted by smugglers. At the time of Elizabeth they were parcelled out amongst numerous owners, from whom they were purchased by the Crown. They are now included in the Duchy of Cornwall by which they are leased to a proprietor. The islands are reached by steamer from Penzance, the average passage taking three hours. Pop. (1901), St. Mary's, 1,355; Treseo, 331; St. Martin's, 175; St. Agnes, 134; Bryher, 97; or a total of 2,092.

Scinde. [SINDH.]

Scintillation is the sparkling or twinkling effect noticeable in stars, and, since it is much more apparent when the star is on the horizon than when it is near the zenith, the effect is attributed to the earth's atmosphere. It is commonly stated that this scintillation distinguishes stars from planets, but some of the planets have been observed to scintillate very slightly when near the horizon, though the phenomenon is not of frequent occurrence. All the stars are so far off that they have no sensible disc even when viewed through a powerful telescope; hence they may be considered as single points of light. The star will therefore send out very few rays of light to the eye compared to the number from the relatively larger planet, and so these few rays will exhibit the effect produced by a heterogeneous atmosphere, whereas the average effect on the greater number of planet rays will be constant. The planet will therefore give a steady light, whereas the star varies every moment.

Scio. [CHIOS.]

Scioppinus, GASPAR, scholar and disputant, was born at Neumarkt, in the Palatinate, Germany, on May 27th, 1576, and was educated at Heidelberg, Altdorf and Ingolstadt. He was originally a Protestant himself, but became a Roman Catholic, and wrote a panegyric of Clement VII. in 1598, for which he was rewarded. He visited Italy, Austria and Spain, and rendered himself obnoxious everywhere by his ferocious onslaughts on Protestants, on James I. (for which he was flogged in Madrid [1614] by Lord Dudley's servants), and afterwards on the Jesuits. His venomous attack, in 1607, on the illustrious scholar, Joseph Justus Scaliger, whom he satirised in his *Scaliger Hypobolimaetus*, did much to embitter that great man's latest years. His works were burnt by the common hangman in London and Paris. They show great learning, and some of the philological treatises are rather valuable, but his extremely partisan spirit destroys much of their merit. He died in Padua, on November 19th, 1649, after a somewhat stormy career. His writings number over a hundred.

Sciopticon is a particular design of optical or magic lantern. A sciopic ball is a perforated wooden globe containing the lens of a camera obscura, equipped with an appliance by which it can be turned on its centre to a slight extent in any direction. It may be fixed at an opening in a window-shutter, and is employed for producing images in a darkened room.

Scipio, PUBLIUS CORNELIUS, THE ELDER, surnamed AFRICANUS, one of the most famous generals of old Rome, was born of noble family in 234 B.C., and in youth was noted for his courage and decision. At the age of twenty-four he was proconsul in Spain, and commanded the forces which took Carthago Nova. His humane conduct was noticeable here as on many other occasions. He gradually made himself master of nearly all Spain, and was offered the sovereignty, but declined it. He formed an alliance with the king of Numidia, and in 206 returned to Rome, where he was welcomed, made consul, and given Sicily as his province. In 204 he went to Africa, and gained many remarkable victories, capturing the Numidian king, who had deserted him, and concluded the second Punic War by the total defeat of Hannibal at Zama in 202. He was offered many honours in Rome, but refused most of them, becoming, however, censor and consul for a second time, and in 193 was ambassador to Syria. Accused and acquitted of embezzling money during the Syrian War of 190, he left Rome for ever, and died in 183. He was a great soldier, very prompt and energetic, an accomplished Greek scholar, and he was also deeply religious.

Scipio, PUBLIUS CORNELIUS EMILIANUS AFRICANUS, THE YOUNGER, conqueror of Carthage, was the younger son of Lucius Paulus Emilius, and was born in 185 B.C. He was adopted by the eldest son of the elder Scipio Africanus, from whom he took the name of Scipio and surname of Africanus. He was partly instructed

by Polybius, and was present at the battle of Pydna, in Macedonia, in 168, a victory won by his father which rendered Northern Greece subject to Rome. In 151 he joined the expedition to Spain, and, after exhibiting his prowess there, proceeded to Africa to take part in the third Punic War. He became consul in 148, and in the following year laid siege to Carthage, and took it, in 146, after the shedding of much blood. By the command of the Senate, the majority being inspired by Cato's reckless dictum, "*Carthago est delenda!*" the city was completely obliterated, in spite of its heroic defence and its being a centre of culture. Scipio was welcomed with acclamation on his return to Rome, and became censor in 142. He effected many reforms, and in 134 again became consul, Spain being his province. He captured Numantia after a stubborn fight, and greatly extended the Roman sway. His marriage with Sempronia, sister of the Gracchi, was unhappy. He lived a simple and, for that period, an extremely moral life, and was at last found dead in bed (129), being assassinated, it is believed, for political reasons.

Scirrhus. [CANCER.]

Scissorsail (*Milvulus forficatus*), an American Flycatcher, with a long deeply-forked tail, which can be opened or closed like the blades of a pair of scissors.

Sclerostoma Duodenale, a nematode worm which sometimes infests the small intestine of inhabitants of Italy and Egypt.

Sclerotium, a densely-compacted tuberculous form of mycelium which occurs in many groups of Fungi as a resting stage and store of reserve material. It consists of a central medullary tissue, often pseudoparenchymatous, enclosed by one or more layers of thick-walled cortical cells. The best-known example is that of the pyrenomycetous *Claviceps purpurea*, which is the ergot, or diseased condition of the ovary of grasses.

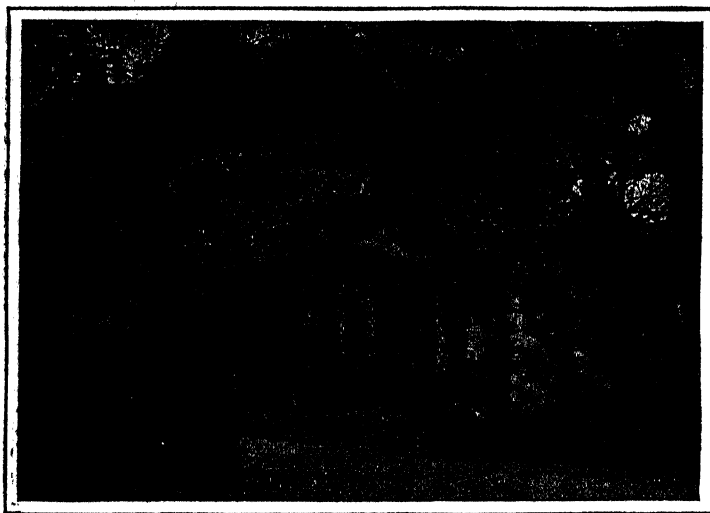


SCOLOPENDRA CINGULATA.

Scolopendra, one of the commonest genera of Centipedes. All the largest and the great majority of the forms are found in tropical and

sub-tropical regions, but a few of the smaller species occur in Europe. The ocelli, or organs of vision, are never more than four in number, and the segments of the body always exceed twenty. One of the largest European species (*Scolopendra cingulata*), three inches and a half long, is met with in the south of Europe, and especially in France. It is of a rusty colour, but the head, antennae, a central band, and the margins of the segments are green. In India and South America several species are nine or ten inches long, and W. S. Dallas says he saw examples brought from the equatorial forests of South America that were more than twelve inches in length.

Scolopendrella is a genus of Arthropods of



SCONE: ABBEY GATEWAY.

(Photo: Cassell & Co.)

great interest, as it appears to some extent to combine some of the characters of Insects and Myriapods. The body is composed of numerous segments, which are in the main similar to one another, and are all provided with limbs. In this character it agrees with the Myriapods and differs from Insects, in which the segments of the body are grouped into three dissimilar sets, and those of the hindmost or abdomen have no limbs. The mouth-parts, however, are arranged very differently from anything known among the Myriapods, as they are situated within the head, and not as appendages upon it; in this *Scolopendrella* agrees with some primitive insects, such as the *Collembola* or Spring-tails. There are, however, some insects with rudiments of limbs on the abdomen (e.g., in the *Thysanura*, and the *ceroopoda* on the last segment of *Orthoptera*, etc.), and thus *Scolopendrella* may be regarded as a primitive type of Insect in which the somites

are not very markedly dissimilar, and the limbs of the abdomen still persist.

Scone (pronounced *Scoon*), a parish of Perthshire, Scotland, comprising the hamlet of Old Scone and the town of New Scone, on the left bank of the Tay, immediately to the north-east of the city of Perth. All that remains of Old Scone is the old cross, as to which it has been said there are plenty of instances of towns losing their crosses, but this is the only cross that has lost its town. In the beginning of the 8th century Scone was the capital of the Pictish kingdom of Pictavia. At the Mote Hill (afterwards called Castle or Hill of Belief, in reference to the episode) the Pictish king, Nechtan,

proclaimed in 710 his acceptance of the Roman date of the observance of Easter, a change of view that led to the expulsion of the Celtic Church from his territories. It was to the Palace of Scone that the Stone of Destiny was brought from Dunstaffnage in 844 by Kenneth MacAlpin. Upon this stone the Scots kings sat during their crowning (Alexander III. being the last so privileged), and it is practically still used in this ceremony in Westminster Abbey (whither it was removed in 1296 by Edward I.), where it has been protected by the old oak Coronation Chair. But, though the Stone had been conveyed ("the wise it call"), the Scots kings up to James IV. (and after him Charles II.)

were still crowned at Scone. The Mote Hill continued in ruder times to be the gathering-place of the early Parliaments. In 1054 a bloody battle was fought at Scone between Macbeth and Siward, Earl of Northumbria, uncle of Malcolm Canmore, whose claim to the throne he had espoused. It was a drawn battle, and Macbeth's time was not yet. Near the site of the present Palace stood the Augustinian Abbey founded in 1114 by Alexander I., which replaced a venerable church dedicated to the Holy Trinity. Both Abbey and the first Palace were destroyed in 1559 by a Perth mob, inflamed by Protestant zeal against all things "Papistical." A new Palace was built by the Earl of Gowrie, and on his forfeiture (1600) James VI. gave the estate to David Murray of Tullibardine, who became Lord Scone in 1605 and Viscount Stormont in 1621, and one of whose descendants, the great Lord Chief Justice,

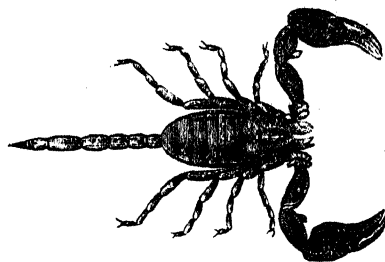
became Earl of Mansfield in 1756, the Palace still being one of the seats of this family. Of the parish church erected on the top of the Mote Hill in 1624 by the first Viscount Stormont only an aisle, containing a marble statue of the builder and other monuments, is extant. The Old Pretender was a guest in the Palace in 1716, and the Young Pretender in 1745. The existing Palace dates from 1803-8. It is a castellated mansion, of somewhat heavy aspect, but stands in a noble park along the bank of the Tay. Among the trees in the grounds are Queen Mary's sycamore and James VI.'s oak and sycamore, and the ancient cross, already mentioned, also stands in Scone Park, some 300 yards to the north-east of the Palace. Queen Victoria and Prince Albert were entertained here on their first visit to Scotland (September 6th, 1842). New Scone, fully a mile to the east (pop. 1,585), almost wholly a residential quarter, dates from the beginning of the 19th century. In the churchyard is a monument to the memory of David Douglas (1798-1834), the traveller and botanist, a native of Scone, who, while on a visit to the Sandwich Islands, fell into a pit-snare for wild animals and was gored to death by a bull.

Scopas, Greek sculptor, almost rivalling Praxiteles, came of a hereditarily artistic family, and flourished in the 4th century B.C. He was born in the Isle of Paros, but very little is known of his life. Among many other works, he designed the principal sculptures for the magnificent mausoleum at Halicarnassus, in Asia Minor, and his "Venus" was greatly admired by the ancients, who assigned him a very high rank among sculptors.

Scoresby, WILLIAM, Arctic explorer, was born at Cropton, near Whitby, in Yorkshire, on October 5th, 1789, and was apprenticed to his father, a master-mariner, with whom he made a voyage to Greenland when he was only 11 years old. In 1806, as chief officer of the *Resolution*, he made 81° 30' N. and 19° E., being the farthest North then reached by any navigator. Being of a studious disposition, he afterwards entered Edinburgh University, and took a degree. He then became commander of a whaler, and published his work, *History and Description of the Arctic Regions*, in 1820. This contained a summing-up of the scientific results of his own voyages and those of earlier explorers. After the death of his wife, in 1822, he determined to enter the Church, studied at Queens' College, Cambridge, for two years, took holy orders in 1825, and was appointed curate of Bessingby, Yorkshire. Before this, however, another important work had appeared, his *Journal of a Voyage to the Northern Whale Fishery*, which included an account of his researches and discoveries on the eastern coast of Greenland. He had meanwhile obtained clerical preferment at Liverpool, Exeter, and Bradford, but still kept up an active interest in science, particularly terrestrial magnetism, and in 1824 was elected F.R.S. He paid visits to America and Australia

in search of additional data in support of his theories on magnetism, and after his return from his second voyage to the United States (1848) drew up some observations on the height of Atlantic waves for the British Association. He also devoted attention to social questions, such as the improvement of the conditions of factory operatives, and in 1850 published a work urging further prosecution of the search for Sir John Franklin and the members of his ill-fated expedition. Scoresby died at Torquay, Devonshire, on March 21st, 1857.

Scorpions, or SCORPIONIDÆ, a family of air-breathing Arachnida. It is characterised by a rather broad anterior part, composed of the cephalothorax and seven distinct segments following it, at the hinder extremity of which come five narrower segments forming a sort of tail, the last point of which is a bulbous piece, swollen at its base, and narrowed and curved



SCORPION.

into a hook at the free end. The bulb contains a pair of glands which secrete a poisonous fluid, which is conveyed by ducts to the minutely but doubly perforated point of the hook which renders the sting so formidable an offensive weapon. The Scorpions strike forward over their head, and in a badly-directed blow the sting may strike some part of the body; this often occurs when the animal is dazed by smoke or fire, and thus may have arisen the story about Scorpions stinging themselves to death when surrounded by a zone of fire. The Scorpions have eight long-jointed legs, and four pincer-like claws; the anterior pair of these is small, and is known as the pair of "chelicerae"; the two hinder pincers are large and strong. The animals breathe by four pairs of lung-sacs, which open to the exterior on the under-side of the abdomen, and four pairs of "stigmata." The Scorpions are the largest and most forbidding members of the Arachnida and are mostly confined to tropical regions. A few occur in Southern Europe: of these *Androctonus occitanus* is three inches long, but in hot countries specimens of twice this length are met with. *Androctonus* is chiefly represented in Africa, but also occurs in Western Asia, as well as in Europe. Its name, meaning "man-killer," shows the terror in which it is held, but though its sting is productive of very painful consequences, it is still doubtful whether it is fatal. *Scorpio Europæus* ranges north-

wards into Germany. The Scorpions shun light, during the day frequenting crevices in rocks and walls, or seeking the shelter of fallen trees and stones. They hunt at twilight, their prey consisting of large insects and their larvæ, and spiders. When on the prowl they carry the long flexible tail elevated over the back of the body, so that the sting is nearly as far forward as the cephalothoracic plate. The victim is seized by the pincers and then stung to death. They select dry places for their quarters and live alone. They will fight one another if brought accidentally together, the victor usually feeding on the slain. As the male is smaller than the female it behoves him to be extremely circumspect and deferential in his approaches, lest he be torn up and consumed. The eggs are hatched in the enlarged oviducts of the female, and the number of the young may amount to sixty. At first the infant Scorpions are carried about on their mother's back. In *The Religion of Ancient Greece* Professor W. M. Flinders Petrie says that "the Scorpion was the emblem of the goddess Sel, and is found in prehistoric amulets; but it is not known to have been adored, and most usually it represents evil, where Horus [the hawk-god of Upper Egypt] is shown overcoming noxious creatures." The oldest Scorpions occur in the Silurian rocks, such as Palæophonus. Eoscorpius is a well-known Carboniferous genus; none occur in the Jurassic rocks.

Scorzonera, a genus of Composite plants, of which there are some 120 species, native to the Mediterranean region especially, but extending also into Central Asia. They are smooth, woolly, or bristly plants, with rather large long-stalked heads of yellow flowers. The best-known variety is *Scorzonera hispanica*, which has been cultivated, principally in Europe, for its root, which is used as a vegetable, and also possesses the medicinal virtues of dandelion. It is sometimes called Spanish Salsafy, from its resemblance to *Tragopogon porrifolius*, and its old popular name was Viper's Grass. The root has a brown skin, whence is derived the French name *écorce noire*, and the Italian, the literal meaning of which is "black bark."

Scot, or SCOTT, MICHAEL, mathematician, physician, and scholar, may have belonged to the family of the Scots of Balwearie, near Kirkcaldy, Fifeshire, Scotland, but was more probably one of the Border Scots. The date of his birth has been placed conjecturally in 1175. He studied at Oxford, Paris (where he acquired a name for his mathematical knowledge), Bologna, Palermo, and Toledo, spending a few years at several of these cities, and entering for a time the service of King Frederick II. of Sicily. He had a competent knowledge of Arabic, which enabled him to translate Avicenna and Averrhoes. There is great reason to believe that he was in holy orders and patronised by the Pope, for Honorius III. and Gregory IX. both begged for promotion for him, the former on the ground of his eminence in science. He was nominated to the archbishopric of Cashel, but declined it on the

plea that he had no Irish. In 1230 he appeared at Oxford, anxious to disseminate the philosophy of Aristotle. He may even have revisited his native land. He died in or before 1234, and late traditions bury him at Melrose and other places in Scotland. His universal fame as a man of science and learning soon made him, in a generally unlettered and superstitious age, the subject of rumour and legend, according to which he was neither more nor less than a professor of the Black Art and in the service of the Devil, his master. He is believed to have written *Liber Physiognomiae* (1477), which, in some points, anticipates Lavater; a translation into Latin of Aristotle's *De Animalibus*; *Quæstio Curiosa de Natura Solis et Lunæ*, a work on alchemy, and *Mensa Philosophica*. Several works on astronomy and alchemy and some translations still exist in manuscript.

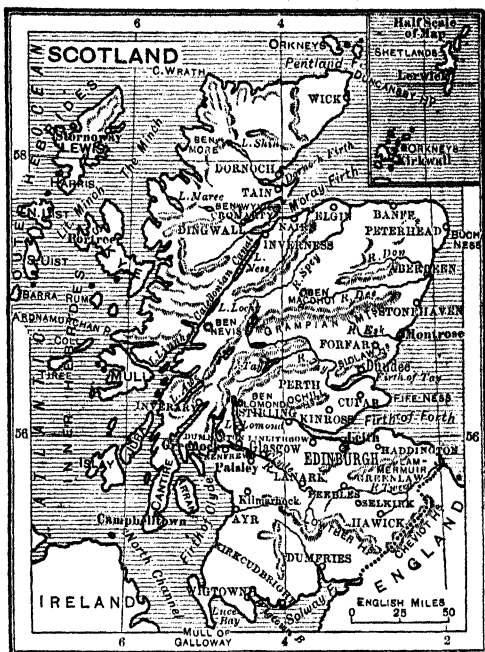
Scot, REGINALD or REYNOLD, disbeliever in witchcraft, son of Richard, second son of Sir John Scot, of Scots Hall, near Smeeth, Kent, was born about 1538. He studied at Hart Hall, Oxford, but left without taking a degree. In 1568 he married Jane Cobbe, of Cobbes Place, Aldington, and after her death in 1584 married Alice Collyar, a widow, to whom when he died on October 9th, 1599, he left his property in consideration, he stated in his will, of the trouble he had been to her, "whom if I had not matched withal I had not died worth one groat." He led an active life in his native county, being collector of subsidies for the lathe of Shepway in 1586-7; member of Parliament for New Romney, 1588-9; and besides the management of his own property attending to the affairs of his cousin, Sir Thomas Scot. In 1574 Scot published *A perfitte Platform of a Hoppe-Garden, and necessary instructions for the making and maintenance thereof*, illustrated with woodcuts, which gained him the credit of originating the cultivation of the hop in England. More remarkable is his famous work, *The Discoverie of Witchcraft wherein the Lewde dealing of Witches and Witchmongers is notablie detected, in sixteen books*, published in 1584, in which he endeavoured to check the persecution of persons charged with witchcraft, alchemy, and magic. Witches were of two sorts only, he said, "the one sort being such by imputation, as so thought of by others (and these are abused and not abusers), the other by acceptance as being willing so to be accounted, and these be meer Coseners." This learned and logical exposure of a popular superstition exhibits Scot as far in advance of his time, and Shakespeare is thought to have been indebted to him for hints for his witches in *Macbeth*. It excited great opposition, and King James I. objecting to its "damnable opinions," ordered it to be burnt by the common hangman. Besides studying the subject in Latin, Greek, and Arabic authors, he pursued it in the village life around him, where cruel punishments were practised, often in the name of religion. Many refutations were

issued, and it is remarkable that belief in witchcraft long kept its hold on the popular imagination, and that men of the calibre of Sir Thomas Browne, Richard Baxter, and John Wesley should have given it credence.

Scoter, or **BLACK DUCK**, a duck belonging to the genus *Oedemia*, with five species from the Nearctic and Palearctic regions. Excepting for a stripe of orange running down the ridge of the bill, the colour of the male is entirely black, the female being of the colour of soot and brownish-white beneath. The Scoter is wholly marine in habits, frequenting the land only for breeding. They congregate in estuaries or off the shore, in such numbers at times as to darken the surface of the sea. Their flesh is decidedly strong, and is ranked as fish in the ecclesiastical dietary. The Velvet Duck, another species, has a white bar on each wing and a white spot under each eye, and is less common than the Black Duck. The Surf Duck, a third species, occasionally seen in European waters, is more at home off the coast of British North America. It has a white patch on the crown and a coloured bill.

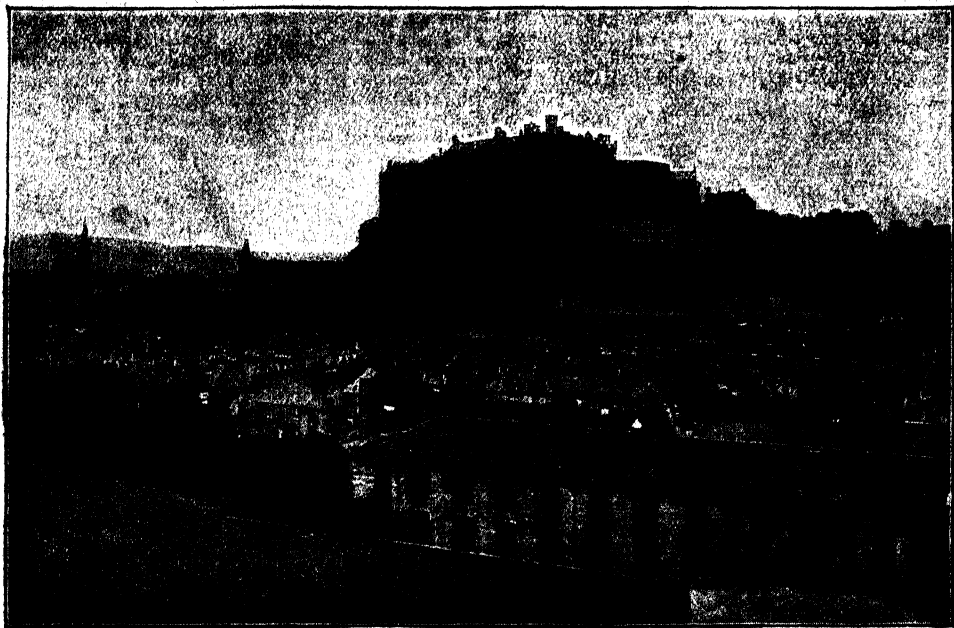
Scotland, the most northerly portion of Great Britain, has an area of 30,902 square miles and a population (1901) of 4,472,103—i.e., about one-fourth of the area, and somewhat more than one-ninth of the population of the United Kingdom of Great Britain and Ireland. It is separated from England by the liberties of Berwick, the north-eastern reach of the Tweed, the Cheviot Hills, the Kershope, Liddel and Sark. Thus, it will be seen, the loose phrase "north of the Tweed" is not based on an accurate appreciation of the southern boundary, since, were the river the delimitation, the bulk of the Scottish Border counties would be English territory. The area is divided between a mainland portion and about 800 islands, of which the Outer and Inner Hebrides or Western Isles on the west, the Orkney and Shetland Islands on the north, and Bute and Arran in the Firth of Clyde are the chief groups. Of the islands, only about fifty are more than five square miles in area. The largest are Long Island, comprising Lewis and Harris (876 square miles), Skye (643), Mull (351), and Islay (246), among the Hebrides; Mainland (378), in Shetland; and Pomona (207), in Orkney. The mainland portion has a total length of about 275 miles, a breadth varying from 25 to 145 miles, and so irregular and indented a coast-line (over 5,000 miles long) that no spot in the interior is more than forty miles from the sea. The Scottish mainland is commonly divided into the Highlands and the Lowlands, the former lying to the north-west of a line running north-east from the Clyde opposite Greenock to Stonehaven on the east coast, and known as the Highland Line; but Forfar, Kincardine, the east and greater half of Aberdeenshire, Elgin and Banff, together with the flat north-eastern portion of Caithness, are reckoned as outside the line. The Highlands are

intersected from sea to sea by Glen More (or great valley), in which lies the chain of lakes connected by artificial channels to form the navigable Caledonian Canal; and the country to the north-west of this line is occasionally distinguished as the Northern Highlands.



SKETCH MAP OF SCOTLAND.

The Western Islands are sometimes included under the general name of "the Highlands"; but the people of Orkney and Shetland, pluming themselves on their Scandinavian descent, regard themselves as distinct from both Lowlanders and Highlanders, though the former feeling of superiority has long since died out. By far the richest, most populous, most industrial, and best cultivated part of Scotland is the plain of the Forth and Clyde, including Fife, which forms the northern part of the Lowlands. Scotland is distinctively a mountainous country. The Highlands are almost covered by the Grampian Mountains—a huge, irregular, lofty mountain-mass, seamed and intersected in all directions by straths and glens (wider and narrower valleys), presenting much grand and imposing scenery. The Cairngorm Mountains form the loftiest group of any size (Ben Macdhui, 4,296 feet; Cairn Toul, 4,241 feet; Cairngorm, 4,084 feet; Ben Avon, 3,843 feet); but the highest summit in the British Isles is Ben Nevis (4,406 feet), near Fort William, in the south-west of the shire of Inverness. In the Lowlands there are various distinct ranges or systems, such as the Sidlaw and



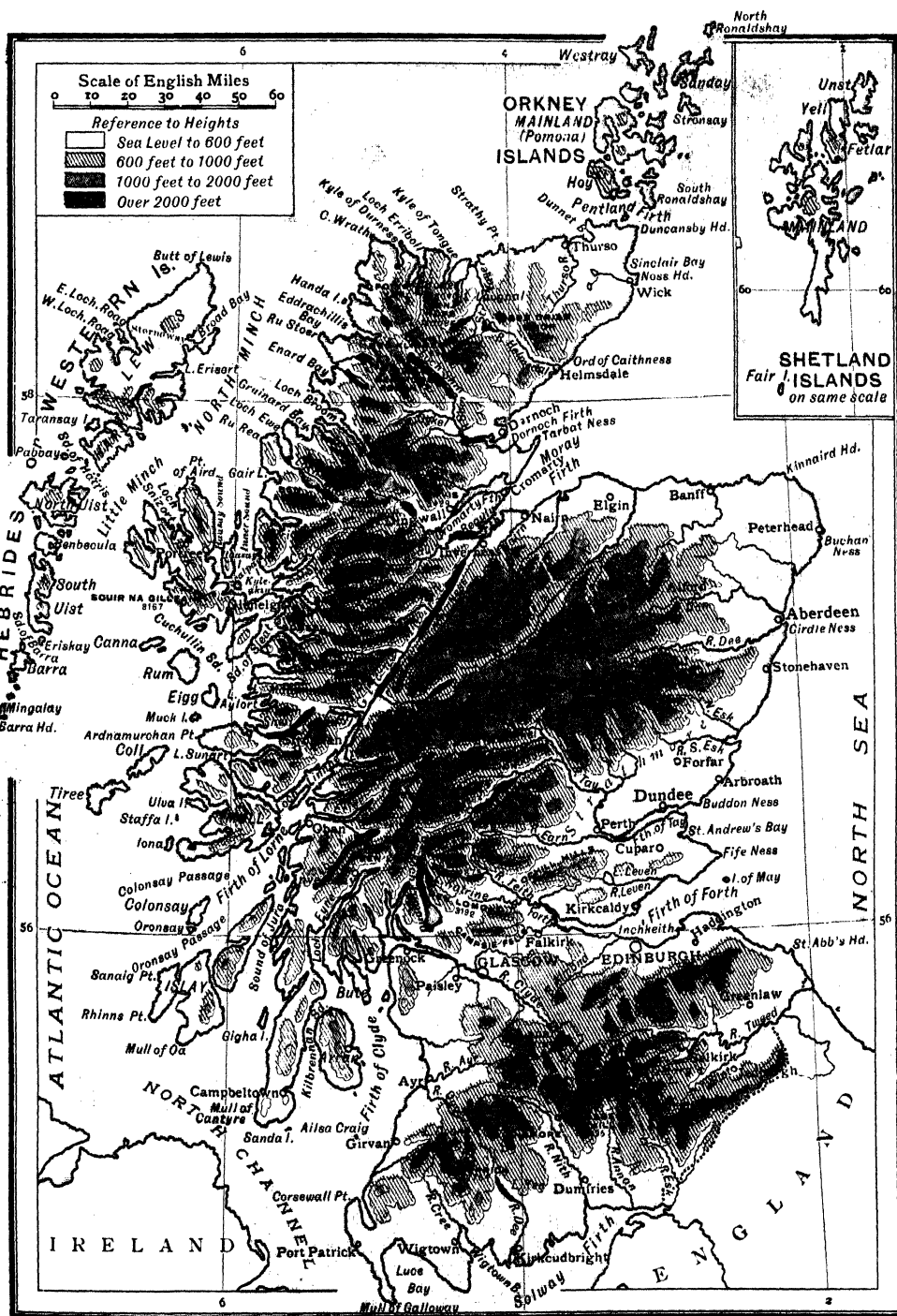
SCOTLAND: EDINBURGH CASTLE.

[Photo: Pictorial Agency.]

Ochil Hills to the north of the Forth, and to the south the Pentlands, the Lammermoors, the Lowther Hills, and the Cheviots on the English Border. The highest summits in the Lowlands are Merrick (2,764 feet), in Kirkcudbrightshire, and Broad Law (2,754 feet), in Peeblesshire. The valleys may be divided into such fertile straths as Strathmore, Strath Tay, Strathearn, Strathallan, and Strathspey, and the richer Carse of Gowrie and Stirling, and the famous mountain glens, such as Glen More, Glencoe, Glencroe, Glendevon, Glen Farg, Glen Lyon, Glen Garry, Glen Nevis, Glen Roy, Glen Shee, and Glen Tilt, with which may be bracketed the mountain passes of Brander, Leny, and Killiecrankie and others. The chief rivers of Scotland are the Clyde (106 miles), Forth (75 miles), and Tay (93 miles), all of which form wide estuaries or firths of great value to shipping. The other numerous rivers are mostly mountain streams of impetuous course and no great depth, but famous for their beautiful scenery and good fishing. The Spey (107 miles), the most rapid river in Great Britain, the Dee (87 miles), the Don (82 miles) and the Findhorn (62 miles) are noted salmon-streams to the north of the Highland Line. The North Esk (29 miles) and the South Esk (48½ miles) are also well-known salmon-streams. In the south are the Nith (70 miles) and the Tweed (97 miles), perhaps the most famous of all,

which forms the Border for about thirteen miles. The famous lochs of Scotland are of two kinds—the sea-lochs or fiords on the west coast, and the inland lochs or lakes proper. Among the former are the numerous lochs running off the beautiful estuary of the Clyde, Loch Fyne (noted for herrings), Lochs Linnhe, Sunart, Nevis, Hourn, Ewe, Broom, Ryan and others. Among the lakes are Loch Lomond—the largest lake in Great Britain—Loch Ness, Loch Awe, and Lochs Tay, Earn, Lubnaig, Achray, Vennachar, Laggan, Shin, Fannich, Shiel, Rannoch, Ericht, Maree, Katrine and Leven. There are numerous other arms of the sea, such as the smaller firths of Moray, Beaully, Cromarty, Dornoch and Lorne, and Luce and Wigtown Bays. The chief headlands are, on the east coast, St. Abbs Head, Fife Ness, Girdle Ness, Buchan Ness, Kinnaird Head, Tarbat Ness, Noss Head and Duncansbay Head; on the north coast, Dunnet Head and Cape Wrath; and on the west coast, Ru Stoer, Ru Coigach, Ru Rea, Ardnamurchan Point, the Mull of Kintyre, Turnberry Head, Corsewall Point, the Mull of Galloway and Burrow Head.

The natural resources of Scotland are not great. Only one-fourth of the area (nearly all in the Lowlands) is under cultivation. In the Highlands vast regions are covered with barren moors, interspersed with scanty pasturage, supporting a limited number of sheep, but chiefly



PHYSICAL MAP OF SCOTLAND.

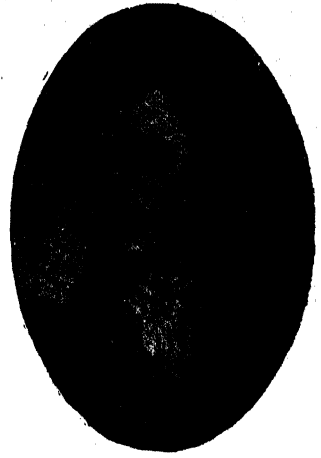
valuable as game-preserves for deer and grouse. These so-called deer-forests are even destitute of trees, for only about 1,400 square miles in all Scotland are under woods. The main industry in this part of Scotland is deep-sea fishing, without which the crofters or small tenants could scarcely make a living. Kelp-burning and weaving are minor industries. Whisky-distilling is, however, of considerable importance, although employing more capital than labour. Agriculture reaches its highest level in the Lothians, Fifeshire and Aberdeenshire; probably no land in the world is better farmed than the holdings of the Lothian farmers. The hills of South Scotland are among the best sheep-walks in the kingdom, and several tracts in the lower Highlands support great herds of cattle. Both the mining and manufacturing industries are practically confined to the Lowlands. The important coal- and iron-fields of Lanarkshire and Ayrshire support various prosperous towns. Fife also has coal in abundance, and Midlothian has coal, oil-shale and lead. Glasgow (761,709 inhabitants) is a commercial and manufacturing city of the first importance; and the shipbuilders of the Clyde enjoy a world-wide reputation. Forfar and Fife have flourishing manufactures of flax and jute, the linen industry centring at Dundfermline (25,250), the jute industry at Dundee (161,173). Paisley (79,350) is the headquarters of the world's thread manufacture and has also a varied assortment of industries. Hawick (17,303), Galashiels (13,615), and Selkirk (6,292) are the chief seats of the woollen and hosiery manufacture, which is also carried on at Kilmarnock (35,091), while Alloa (14,458) is celebrated for its yarn. Edinburgh (316,837), a famous educational centre, is the seat of the book-trade and has a large printing business. The chief seaports are Glasgow, Leith (77,439 inhabitants, the port of Edinburgh), Greenock (68,142), Dundee, Grangemouth (8,386), and Aberdeen (153,503). Wick and Fraserburgh are herring-ports. Perth (32,872), Stirling, Ayr (29,101), St. Andrews (7,619) (famed for its golf links), and Dumfries (14,444) are of historical importance only, excepting that Perth has the largest dye-works in the world. Oban (5,374), Portree (in Skye), Stornoway (in the Lewis, 3,852), Inveraray, besides numerous inland spots like Callander, Braemar, Lanark, Moffat, Peebles and Melrose, are well-known tourist centres, as is also Inverness (23,066), the "capital of the Highlands."

The population of Scotland has increased from 1,608,420 in 1801 to 4,472,103 in 1901. The Celtic Highlanders are quite distinct in history as in language from the Teutonic Lowlanders; and though this distinction is perfectly living to this day and fully understood by the Scots among themselves, it is interesting to note that there is, as against "foreigners," a strong national solidarity that pays more attention to the geographical boundary of the country than to this ethnographical or linguistic division. The language of the Highlands is Gaelic, but of the

230,806 Gaelic-speaking inhabitants returned at the census of 1901, only 28,106, or 0.63 per cent. of the total population spoke Gaelic solely. The language of the Lowlands ("Broad Scots") is an independent development of the original tongue brought to Great Britain by the Teutonic invaders from the Continent, and not a corruption of southern or book-English. It is, however, no longer the tongue of the educated classes in Scotland, although it has a rich literature (perfectly distinct from the contributions of Scotsmen to English literature) extending back for 600 years, culminating in the poems and songs of Robert Burns (1759 - 96), and still being added to.

Though the Crowns of Scotland and England have been united since 1603,

and the Parliaments since 1707, the smaller country has maintained a very distinct individuality, both in the character of its people and in many of its institutions. In Church, law, and education, this is very evident. Apart from the Roman Catholics and a large number of quite insignificant sects, the vast majority of Scotsmen belong to one or other of the two great Presbyterian bodies: the Established Church of Scotland ("the Establishment," dating from 1560 and renewed in 1688), and the United Free Church of Scotland, the latter resulting from an amalgamation (in 1900) of the Free Kirk (founded in 1843, known as the Disruption year) and the United Presbyterian Church ("the U.P.'s" of popular parlance, constituted in 1847 by a union of the Secession and Relief Churches). At the time of the constitution of the United Free Church, a minute minority (called popularly the "Wee Frees") claimed that the union could not be legally effected and that they were the Free Church of Scotland. Though the Scots courts decided against them, the House of Lords, on appeal, upheld their contention, but a Royal Commission having reported that they were unable adequately to carry out the trusts of the vast property thus handed over to them (in defiance of public sentiment), an Act was passed in 1905 to apportion the property between the two bodies. The Auld Kirk and United Free differ on points of government (not doctrine) that seem



ROBERT BURNS.

(From the portrait by Alexander Nasmyth in the National Gallery, Edinburgh.)

very minute to all but Scottish ecclesiastical politicians and "yillcaup commentators," especially since the abolition of patronage in the Established Church, in 1874, removed the chief bone of contention. One important result of the existence of two such bodies is the fact that in Scotland "Dissenters," as such, have never suffered loss of social status. Ecclesiastically Scotland is divided into parishes, and local government has generally accommodated itself to this division, so that there is but little of that overlapping of jurisdiction that makes English local government such a puzzle to the uninitiated. Counties are administered by county councils, and the cities and most of the towns by municipal bodies, the chief magistrates being called provosts and the magistrates bailies. The chief magistrates of Edinburgh, Glasgow, Aberdeen, Perth and Dundee are entitled to the designation of Lord Provost. An excellent system of public parish schools was established by law in Scotland in 1696, and the result is shown in the high level of education among the peasantry. These parish schools, however, have been superseded by Board schools since the Education Act of 1872. The better-class secondary schools are for the most part day-schools, the few Public Schools—of which Loretto in Musselburgh, Trinity College in Glenalmond, and Fettes College are the chief—being in the main imitated from the English type. The grammar-schools in many of the larger towns are under the jurisdiction of school boards, and of such institutions the Royal High School of Edinburgh has a long and illustrious history. Scotland has four universities; at St. Andrews (founded 1411), Glasgow (1450), Aberdeen (1494), and Edinburgh (1582). These resemble Continental rather than English universities, there being no college-residence and practically no collegiate supervision of the students outside the lecture-rooms. Scotland has retained its own system of law, largely based on Roman law, so that there are considerable divergencies from English law on such points as marriage, land-holding, poor-law, etc., as well as in points of procedure. In every county there are sheriff-courts for minor cases; but the supreme courts are the Court of Session, with Inner and Outer Houses (for civil causes), and the High Court of Justiciary (for criminal cases) at Edinburgh. The House of Lords is the final court of appeal in civil causes. Scotland has also a Secretary of State (constituted in 1894), a Lord Advocate and a Solicitor-General.

Caledonia, as Tacitus calls Scotland to the north of the Forth and Clyde, was more than once invaded, but never subdued, by the Romans. Its inhabitants were the Celtic-speaking Picts or Cruithne, who were also found in the south-west of modern Scotland, while the south-east was peopled by Britons. About the end of the 5th century the Scots, a Celtic tribe from the north of Ireland, established themselves in Argyllshire and on the west coasts. Before the time of Bede (8th

century) a fourth race, the Saxons, obtained a footing in the south-east, while the Scandinavians had long before acquired power in the Orkneys and the western islands. The Scots gradually gained the upper hand, and about 843 Kenneth Macalpin became king of the Scots and Picts, his kingdom (wholly to the north of the Forth and Clyde) being known as Alban. The name Scotland first emerges in the 10th century. Christianity was introduced among the Southern Picts by St. Ninian in the 4th century, and among the Northern Picts by St. Columba in the 6th. The successors of Kenneth extended their power southwards, up to and beyond the present Border, but the far north and the distant islands long remained practically independent. Under Malcolm (III.) Canmore (1058-93), who succeeded the able usurper Macbeth and had married the English princess Margaret, the English language and customs gained ground; but immensely greater strides in civilisation and in the organisation of Church and State were made under David I. (1124-53), the "Scottish Alfred," though James VI. could only regard him as a "sair eanet for the Crown," in consequence of his many gifts of land and money to the Church. William the Lion (1165-1214), captured by Henry II., regained his freedom by an illegal oath of fealty, which, though remitted by Richard I. in 1189 for a payment of money, was long afterwards the pretext for much unhappy interference in Scottish affairs on the part of the English kings. From William's reign also dates the first of the alliances with France, which have left many traces on later Scottish history. The wise and beneficent Alexander III. (1249-86) was succeeded by his infant granddaughter Margaret, "the Maid of Norway," who died in 1290, on her way to Scotland. Edward I. of England, invited to act as umpire in the ensuing dispute as to the succession between John Baliol and the elder Bruce, decided in favour of the former (1292). Baliol, however, was carried prisoner to London in 1297, and Edward, in his efforts to reduce Scotland under his own sceptre, was confronted by the patriot William Wallace, who, after some successes, was captured and beheaded in 1305. The struggle for freedom was carried on by Robert Bruce (1306-29), who finally triumphed at Bannockburn in 1314. Robert II. (1370-90), Bruce's grandson, and Robert III. (1390-1406), the first two kings of the Stewart dynasty, were succeeded by five Jameses in succession. James V., dying in 1542, left the kingdom to his infant daughter Mary (1542-87), afterwards the famous "Queen of Scots," whose career fills so romantic a page of history. Mary abdicated in 1567 in favour of her son James VI. (1567-1625), who succeeded to the English throne in 1603, thus uniting Great Britain under one Crown. The history of Scotland under the earlier Stewarts is a record of fierce struggles between the Crown and the powerful nobles, punctuated by difficulties with the turbulent Highlanders, and by costly wars

with England, culminating in the disaster of Flodden (1513), where James IV. perished with the flower of the country. The condition of the people, at least in the south, was, however, gradually improving, and this period added many famous names to Scottish literature. The Reformed religious doctrines penetrated



JOHN KNOX.

to Scotland early in the 15th century, and championed latterly by John Knox, were formally approved by the Parliament in 1560. The Scottish Reformers and common people were Calvinistic Presbyterians, while James VI. and his successors were zealous adherents of Episcopacy. This difference of opinion developed under Charles I. (1625-49) into open and

bitter strife; and on the outbreak of the great Civil War Scotland joined the English Parliament against the king. On the execution of Charles I., however, Charles II. (1649-85) was immediately proclaimed king in Scotland, but Cromwell and afterwards Monk, effectually made themselves masters of the country. After the Restoration in 1660, the religious troubles in Scotland again broke out, the Covenanters resisting to the death the introduction of Episcopacy. The persecution was but slightly relaxed under James VII. (1685-88), but religious freedom was finally attained under William and Mary (1688-1702). The Scottish and English Parliaments were united in 1707, in the reign of Anne (1702-14), the younger daughter of James VII., but there still lingered a certain jealousy between the two nations, which encouraged the Jacobites, or adherents of the expelled Stewarts, to rise in 1715 and again in 1745 (under Prince Charles Stewart). These risings were firmly quelled, and, the advantages of an alliance with a rich and prosperous country gradually making themselves felt, Scotland settled down into a loyal and useful member of the United Kingdom. Its subsequent general history is substantially identical with that of England.

Scotland Yard, a district adjoining Whitehall, on the east, in London. It is believed to occupy the site of a palace, with pleasure grounds extending to the Thames, which was the residence of the earlier Scottish kings (hence its title) on their occasional visits to London to do homage for their fiefs in Cumberland and Westmoreland. This custom is said to have originated with Kenneth III., and the last royal tenant of the palace was Queen

Margaret, sister of Henry VIII. and wife of James IV., who fell at Flodden in 1513. When Henry became reconciled to her after her marriage with the Earl of Arran, he entertained her here in great state, and she resided here during her second widowhood. At the Reformation the building had already been sadly neglected, in Elizabeth's time it was a ruin, and, upon the union of the Crowns in 1603, when its *raison d'être* ceased, it was dismantled and partially demolished. Among distinguished occupants of the houses built on its site were John Milton, Beau Fielding, Inigo Jones, Sir John Denham the poet of *Cooper's Hill*, Sir Christopher Wren and Sir John Vanbrugh the architect and playwright. In 1829 public use was found for the somewhat shabby-looking buildings, for they were converted into the headquarters of the Metropolitan Police Force then constituted by Sir Robert Peel. Here the Police remained until 1890, when the establishment was removed to New Scotland Yard, the handsome edifice specially built for it after the designs of Norman Shaw, R.A. [POLICE.]

Scots Greys, a regiment of cavalry forming the Second Regiment of Dragoons in the British army. It was raised in Scotland in 1678 and has had a glorious record. Among the battles in which it has borne a part were those of the Duke of Marlborough's campaigns—Blenheim, Ramillies, Oudenarde and Malplaquet;—Dettingen, the last action in which a British king was personally engaged (1743); Waterloo; Balaklava and Sebastopol, in the Crimean War, and the relief of Kimberley and Paardeberg in the Boer War. Its badge is the thistle within the circle and motto of St. Andrew, its crest an eagle, and its motto *Nulli Secundus*—"Second to None."

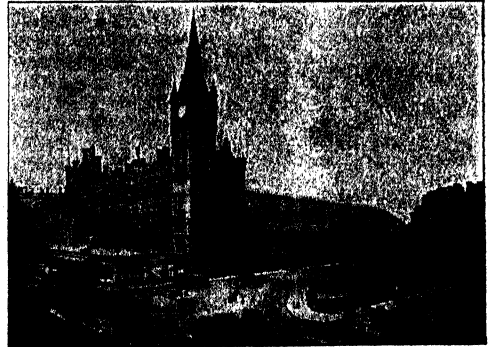
Scots Guards, a name now used for a celebrated household regiment in the British army (till lately, Scots Fusilier Guards), but also applied to the Scottish troops who for many centuries served under the kings of France. The alliance of the two countries was due to their common enmity to England brought about by the ambitious designs of Edward I. The nucleus of the Scottish forces in the French army was a body of nearly 10,000 men led by the Earl of Buchan, which disembarked at La Rochelle in 1419. Charles VII. divided these Scotsmen into two distinct corps—"Les Gendarmes Écossais" (the Scots men-at-arms), and "La Compagnie Écossaise de la Garde de Corps du Roi" (the Scots Lifeguards). The loyalty of the Scots Guards was not more conspicuous than their heroism in battle, and they played a distinguished part in the wars of Charles VIII., Louis XII., and Francis I. They ceased to be composed of Scotsmen after the Seven Years' War, and were disbanded at the Revolution. Their final abolition took place in 1830.

Scott, DAVID, painter, was born in Edinburgh on October 10th or 12th, 1806. He learned his

art from his father, an engraver, and afterwards studied at the Trustees' Academy. He began to exhibit at the recently-founded Scottish Academy in 1828, and became a member two years later. Perhaps his earliest artistic achievements of note were his illustrations (1831) for Coleridge's *Ancient Mariner*, which are admirable, as are also those designed by him towards the close of his life for *The Pilgrim's Progress*. He excelled in the weird and imaginative style, not unmingled with a love of the morbid, and he had a fatal fondness for vast canvases. In 1832 he visited Rome, where he produced some admirable pictures. His "Vasco da Gama Encountering the Spirit of the Storm as he passes the Cape of Good Hope," which some consider his masterpiece, was exhibited in 1847, and is now in Trinity House, Leith. He competed for the decoration of the Houses of Parliament, and the disappointment caused by his non-success hastened his death, which took place in Edinburgh on March 5th, 1849. In 1851 were published his fine series of imaginative designs to the ninth edition of Professor Nichol's *Architecture of the Heavens*. His "Vintages" and "Ariel and Caliban" are in the National Gallery in Edinburgh, and his "Achilles addressing the Manes of Patroclus" is in the Sunderland Gallery.

Scott, SIR GEORGE GILBERT, architect, was born on July 13th, 1811, at Gawcott, near Buckingham, England, where his father, Thomas Scott, son of Thomas Scott the commentator, was perpetual curate. His love for drawing ecclesiastical buildings manifested itself early, and led to his being articled to James Edmeston, a London architect, who disapproved of the time he wasted in sketching mediæval edifices. Scott afterwards became clerk of the works at the new Fishmongers' Hall, at London Bridge, and after gaining further experience entered into a partnership with an old fellow-pupil, W. B. Moffat, which was chiefly remarkable for the number of cheap and ugly workhouses they designed. The meanness of his first churches is traceable to his early influences, and not until 1839 did he become acquainted with the true principles of Gothic art, through the writings of A. W. Pugin and the work of the Camden Society. Enthusiastic study of the styles of the Middle Ages induced him to adapt a 13th-century Queen Eleanor cross when designing the Martyrs' Memorial erected at Oxford in 1840. His first important Gothic building was the church of St. Giles, Camberwell, and henceforth he became identified with that style. He made a European reputation by his design for the Lutheran church of St. Nicholas, Hamburg, which he won in open competition in 1844. The partnership with Moffat was dissolved in 1845. In 1847 he was appointed to restore Ely Cathedral, which led him to make a careful study of the great churches of France, the real home of Gothic ecclesiastical architecture, and in 1851 he visited northern

Italy to pursue his studies. Appointed architect to the dean and chapter of Westminster in 1849, where he restored the Chapter-house, in 1855 he was elected A.R.A. (R.A. in 1860), and he was again successful in an open competition at Hamburg for a design for the Rathhaus, which, however, was built from an inferior design. Scott's designs for the new Government offices in London, 1856, provoked a battle of opposing styles. Unwillingly he consented to adopt a classical design, which



ST. PANCRAS STATION, LONDON.

(Photo: F. G. O. Stuart, Southampton.)

passed the House of Commons five years later to the wrath of the Gothic faction. In 1864 he was engaged on the Albert Memorial, Kensington, his design having been chosen in a limited competition. His intention was to make a "kind of ciborium to protect the statue of the prince" in the style of the 13th century. In 1865 he designed the station and hotel at St. Pancras, which he considered best realised his ideas on the adaptation of Gothic to modern uses. His works were more numerous than those of any of his contemporaries and he undertook more commissions than it was practicable for him carefully to superintend. That several of his restorations met with severe censure was therefore natural. An incomplete list of over 700 buildings with which he was concerned in different capacities proves his activity. His published works include *A Plea for the Faithful Restoration of Ancient Churches*, *Remarks on Secular and Domestic Architecture*, *Gleanings from Westminster Abbey*, and *Personal and Professional Recollections*. Scott married his cousin Caroline Oldrid in 1838; in 1872 he was knighted, and when he died, on March 27th, 1878, he was buried in Westminster Abbey. Two of his five sons became architects and completed some of the works left unfinished at his death, which included refitting the choir of Canterbury Cathedral and St. Mary's Cathedral in Edinburgh.

Scott, JOHN, EARL OF ELDON. [ELDON.]

Scott, MICHAEL, novelist, was born at Cowlairst, Glasgow, on October 30th, 1789, and educated at the High School and University of Glasgow. At the age of seventeen he went to Jamaica, where he stayed sixteen years. On his return he engaged in commercial pursuits, but found leisure to write and publish his *Tom Cringle's Log*, which appeared anonymously in *Blackwood's Magazine*, and came out as a volume in 1834, and *The Cruise of the Midge*, which was published in book form in 1836. They were both very popular, the first being one of the most striking sea-stories ever written. He died in Glasgow on November 7th, 1835.

Scott, ROBERT, lexicographer, was born on January 26th, 1811, at Bondleigh, Devonshire, where his father, Alexander Scott, was rector. Educated at Shrewsbury School and Christ Church, Oxford, he became Fellow of Balliol in 1835, in which year he was ordained. Appointed to the college living of Duloe, Cornwall, in 1845, and in 1850 rector of South Luffenham, Rutland, he was elected master of Balliol in 1854, which, under his rule, became one of the leading colleges in Oxford. In 1870 he became dean of Rochester, where he remained until his death on December 2nd, 1887. Twice select preacher at his university and member of the Committee for the Revision of the New Testament and the Apocrypha, his devotion to his duties and to learning was pre-eminent. With his friend, Dr. H. G. Liddell, dean of Christ Church (to which they were both elected students in January, 1830), he compiled the great *Greek-English Lexicon*, founded on Passow's *Lexicon*, without which, they said, "as a base to work upon, our own would never have been compiled." This work marked an epoch in Greek scholarship and was soon found to be indispensable to every student. Begun in 1836, the first edition appeared in 1843, and until the seventh and definitive edition was brought out in 1883 its authors had it continually under revision.

Scott, THOMAS, commentator, tenth of John Scott's thirteen children, was born at Braytoft, Lincolnshire, on February 4th, 1747. Apprenticed to a surgeon, by whom he was soon dismissed for misconduct, his father, a grazier, set him to herdsman's work. After nine years he left home in disgust at his father's harsh treatment. Encouraged by Archdeacon Gordon in his desire to become a clergyman, he was ordained in 1772. He became curate of Weston Underwood, taught himself Hebrew and studied the Scriptures in the original tongues. In 1781 he succeeded John Newton as curate of Olney, and in 1785 became joint chaplain of the Lock Hospital, London, which he held with the lectureship of St. Mildred's, Bread Street. In 1801 he was instituted to the rectory of Aston Sandford, Buckinghamshire, where, in 1807, at the wish of the Church Missionary Society, he undertook the training of missionaries, and where he died on April 16th, 1821. His

funeral sermon was preached by Daniel Wilson, afterwards Bishop of Calcutta. Scott's best known work is his celebrated *Commentary on the Bible*, which Sir James Stephen considered "the greatest theological performance of our age and country." Issued in weekly numbers, which started on March 22nd, 1788, it involved its publisher, Bellamy, in bankruptcy and ruined its author. After two Chancery suits and grave pecuniary anxieties, which lasted until 1813, Charles Simeon and other admirers came to the rescue. Scott's liabilities were discharged and he gained some £2,000. He also published several sermons and an interesting spiritual autobiography, *The Force of Truth*. Cardinal Newman in his *Apologia* acknowledges that to Scott "(humanly speaking) I almost owe my soul," and if the *Commentary* and its author's Calvinistic fervour are now somewhat out of fashion, yet all who reverence Newman, who esteemed his "bold unworldliness and vigorous independence of mind," will honour Thomas Scott's memory.

Scott, SIR WALTER, novelist, poet, and historian, was born in College Wynd (since demolished), Edinburgh, on August 15th, 1771. The descendant of a famous Border family, he was



SIR WALTER SCOTT.
(By Sir H. Raeburn.)

early filled with reverence for the past, which was fostered by his mother's tales of bygone days. As a child, he developed a lameness which lasted throughout his life, but never interfered with his enjoyment of all kinds of exercise. "Always the more mischievous the better sport for him," wrote a witness of one of his freaks in a boat; and his love for outdoor pursuits was increased by a hospitality which made

him happiest when the centre of the largest party. His sympathy won the affection of all classes. "He was the only one," said James Hogg, the Ettrick Shepherd, "I ever knew whom no man, either poor or rich, held at ill-will," and his kindness, extending itself beyond his friends, constituted almost a personal tie between him and his horses and dogs. He was an ideal Scottish laird, and people wondered when he found time for his literary labours; yet in this profusion of enjoyment, his life was filled with hard and varied work. During his education at Edinburgh High School, and at Kelso, he learned no Greek, but

gained a knowledge of Latin, to which he added a study of Italian and Spanish. On leaving school he attended classes at the University of Edinburgh, and in 1786 was apprenticed to his father, a writer to the signet. In this year he had his only sight of Robert Burns, whom he met at Dr. Adam Ferguson's. The poet was affected by some lines of John Langhorne's printed on an engraving of a dead soldier, and inquired whose they were. The lad Walter (who from childhood had been an omnivorous if desultory reader) was able to tell him, and was rewarded by a grateful look from eyes which, as he said, "literally glowed." During his youth he was deeply attached to Williamina Belsches-Stuart, who, however, married his friend, Sir William Forbes, in 1796. In the following year he married Charlotte Charpentier or Carpenter, a lady of French descent, by whom he had four children, of whom three survived him for a short time. His practice at the bar, to which he had been called in 1792, was never great; but two years after his marriage he was made sheriff-depute of Selkirkshire, and in 1812 Clerk of Session. These appointments, together with his success in literature, enabled him to indulge his desire to possess an estate. He therefore purchased Abbotsford, where he spent much of his time and money in planting and building. In 1815 he refused the laureateship, which, at his request, was given to Robert Southey. In 1818 the Prince Regent offered him a baronetcy, which he accepted, although he did not assume the title until 1820. Meanwhile his expenditure at Abbotsford, and his secret connection with the publishing and printing firm of Ballantyne and Company, were preparing a disaster. His partners became involved in the bankruptcy of Archibald Constable in 1826, and Scott found himself confronted with a debt of £117,000. This he determined to pay with his pen, and in five years he actually reduced it to £54,000, by writing entirely for his creditors. Sir Walter footed the bill with a courage that fell not short of the heroic and lost his life in the Herculean effort to preserve his name unstained, setting, however, a high and noble example that makes us feel the better for his having lived and renders him as a man the pride and glory of literature. In 1826 his wife died; in 1830 he had an attack of paralysis. His brain was affected, and in the following year he tried a journey to Italy, without avail. He returned to Abbotsford, where he died on September 21st, 1832. Sir Walter's literary work began with a translation from Bürger in 1796, and a translation of Goethe's *Götz von Berlichingen* in 1799, but his mark in his own department was made in 1802 with his *Minstrelsy of the Scottish Border*, for which he had "raided" the southern counties during the holidays and leisure of several years. In 1805 *The Lay of the Last Minstrel* brought him immediate popularity. *Marmion* appeared in 1808, *The Lady of the Lake* in 1810, *Rokeby* and *The Bridal of Triermain* in 1813, and *The*

Lord of the Isles in 1815. Meanwhile Scott had felt his inferiority to Lord Byron in poetry, and had determined to try his powers in prose. He took up the first chapters of *Waverley*, which he had thrown aside some years before, completed the story in a few weeks, and published it in 1814. Its reception, in spite of the anonymity on which Scott insisted for all his novels, until the year 1827, was so favourable that it decided the author's future. The rest of the *Waverley Novels* followed in rapid succession right up to 1832, some of them published as separate stories, others as parts of the various series of *Tales of my Landlord*, and *Chronicles of the Canongate*. Scott, however, did not confine his marvellous literary activity to poetry and fiction; he edited State papers, poured forth article after article, published biographies of Dryden (1808), and Swift (1814), with editions of their works, and brought out a life of Napoleon Bonaparte (1827). His *Tales of a Grandfather* appeared in three series in 1828, 1829, and 1830. The popularity gained by his first poem, and increased by each subsequent work, has never been lessened. The influence of Scott has been marked in the development of romantic literature in England and France, while the glamour which he threw around the life of the Middle Ages admittedly contributed to the ecclesiastical movement caused by the Oxford *Tracts for the Times*. The secret of his power lies not in the subtle analysis of character, but, as he himself recognised, "in the hurried frankness of composition, which pleases soldiers, sailors, and young people of bold and active dispositions." With no deep spiritual message, he teaches a doctrine of broad, sound life, and, as one of his biographers has observed, he takes his readers out of the trivial interests of private society, and places them in the current of national feeling. It is not too much to say that he has transformed the past into a living present, and thus already has quickened the study of history for several generations.

Scott, WILLIAM, LORD STOWELL, judge, son of William Scott, merchant, of Newcastle-on-Tyne, and elder brother of Lord Eldon, was born on October 17th, 1745, the year of the rebellion in the north. The alarm which it created caused his mother, to escape an expected siege, to go to her father's house at Heworth, Durham, where she gave birth to twins, William and a daughter named Barbara. To the accident of being a native of Durham, after being educated at Newcastle Grammar School, he was able to enter Corpus Christi College, Oxford, where he gained a scholarship open to persons born in that county. He matriculated in 1761, and in 1764 was elected to a Durham Fellowship at University College, and appointed one of the two tutors. From this he retired two years later, and devoted himself to close study of that branch of the law in which he afterwards became distinguished. He took the degree of D.C.L. in

1779, was called to the bar in the following year, and elected to practise in the Admiralty and Ecclesiastical Courts. In spite of his want of ability at first as a speaker his success was remarkable. Briefs and appointments multiplied upon him. Knighted in 1788, he was made king's advocate-general and vicar-general of the province of Canterbury, and became judge of the High Court of Admiralty on October 26th, 1798, and a Privy Councillor. He entered Parliament as member for Downton in 1790, and in 1801 was elected member for Oxford University, which he represented until 1821, when, on the coronation of George IV., he was created a peer. An opponent of change, a wit and very courteous, a great eater and drinker, Stowell, who was twice married, lived until January 28th, 1836, when he died at Earley Court, Berkshire. At Oxford he was introduced by Robert Chambers to Dr. Johnson, whose intimate friend and executor he became; friend also of Sir Walter Scott, who said "He was one of the pleasantest men I ever knew." Lord Stowell was one of the greatest of English judges. His service to maritime and international law was unequalled. Unfettered by earlier judgments his vast learning enabled him to systematise a department of English law. "His decisions have passed into precedents, equal, if not superior, in authority to those of the venerable fathers of the science." On maritime points many of his decisions remain as the only law. "If ever the praise of being luminous could be bestowed upon human composition," said Lord Brougham, who equally admired his character and great powers of reasoning, "it was upon his judgments."

Scott, WILLIAM BELL, poet, painter and critic, was born in Edinburgh on September 12th, 1811, and educated at the Royal High School. He studied art first under his father, and afterwards at the Trustees' Academy in his native city and the British Museum, where he drew from the antique. In 1837 he moved to London and occasionally exhibited at the different galleries and the Royal Academy. He competed for the decoration of the Houses of Parliament and, though his cartoon was unsuccessful, its merits procured him the mastership of the Government School of Design at Newcastle-on-Tyne in 1844. During his twenty years' residence in the north he executed for Sir Walter Trevelyan at Wallington Hall a series of eight large pictures illustrating incidents in the history of Northumberland and the Border and eighteen decorative oil paintings from the ballad of Chevy Chase. He removed to London in 1864, and gave up a good deal of time to literary work, his principal contributions to art at this period being the series of pictures which he painted in 1868 for the circular staircase in Penkill Castle, Ayrshire, drawing his subjects from the *King's Quhair* by James I. He died in Penkill Castle on November 22nd, 1890. He was a poet of considerable dis-

tingtion and produced *Hades* (1838), *The Fear of the World* (1846), and volumes of *Poems* in 1854, 1875, 1882 and (posthumously) 1893. He was also the author of a memoir of his painter-brother David Scott (1850), *Half-Hour Lectures on the History and Practice of the Fine and Ornamental Arts* (1861), and *Albert Dürer* (1869), and numerous other works, besides editing popular editions of John Keats, P. B. Shelley, S. T. Coleridge, Lord Byron, and other poets.

Scott, WINFIELD, soldier, was born in Dinwiddie County, near Petersburg, in Virginia, United States, on June 13th, 1786. He was educated at William and Mary College, Williamsburg, and, studying law, was called to the bar in 1806. He entered the army as a lieutenant in 1808, and in 1812 had risen to the rank of lieutenant-colonel. He was sent to the Canadian frontier, and saw some fighting there, becoming brigadier-general in 1814. He was severely wounded more than once, and after the war was offered the post of Secretary of War, but declined it, Congress thanking him for his services and promoting him. He was sent on several expeditions against the Indians, and in 1841 became Commander-in-Chief of the United States army. He commanded during the Mexican War, and captured Vera Cruz and other places, finally entering the city of Mexico in September, 1847. He retired from active service in 1861, and died at West Point, New York, on May 29th, 1866. He was a great tactician, a man of commanding presence, and a stern disciplinarian (which earned him his nickname of "Fuss and Feathers"), and wrote some excellent works on military tactics.

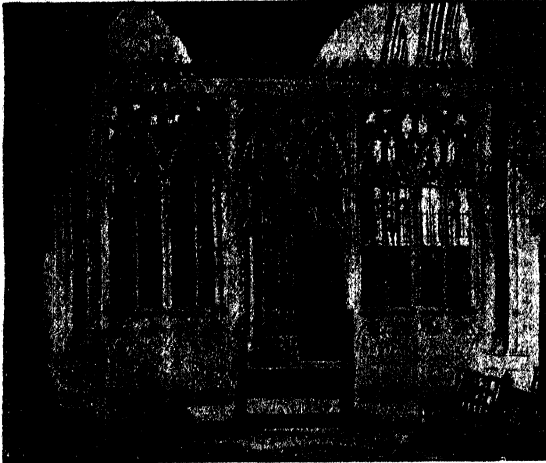
Scotus. [DUNS SCOTUS; ERIGENA.]

Scranton, capital of Lackawanna County, Pennsylvania, United States, on the Lackawanna, 160 miles north of Philadelphia. Till 1840 it was known as Slocum Farm, but in that year the blast-furnace erected by George and Joseph Scranton laid the foundation of its prosperity and it was named after the brothers. It is the centre of the anthracite region and has rolling-mills, steel-works, steel-rail mills and furnaces, besides manufactures of locomotives, machinery, tools, carriages, leather, silks and lace curtains. The principal structures include Government building, the city hall, court-house, Allbright Memorial Library and the Roman Catholic Cathedral. Pop. (1900), 102,026.

Screamer, a bird belonging to the three species of the South American family Palamedeidae, allied to the ducks and geese. There are two strong spurs on each wing, which are of service to the birds in defending themselves and their young from attack. Generally they are of shy and gentle habits and, owing to their broad and powerful wings, are strong fliers. The Horned Screamer (*Palamedea cornuta*), from Guiana, rather smaller than a turkey, has blackish-brown plumage and an erectile horn on the head. The

Crested Screamer (*Chauna chavaria*), from Southern Brazil and Paraguay, and the **Derbian Screamer** (*C. derbiana*), from Colombia, have erectile feathers, but no horn. The former is domesticated and allowed to run with poultry that it may defend them from the vultures.

Screen, as an architectural term, denotes a partition separating one portion of a chamber



LADY CHAPEL SCREEN, EXETER.

or an edifice from the remainder. In the halls of mediæval residences the space thus cut off formed a lobby which communicated with the hall proper through doors in the screen, and was surmounted by a gallery. These screens were of wood, and consisted of close panelling below and open work above. In churches, screens separated chapels from the nave, choir, or aisles, or they were put up as protection to tombs; but the most important was the rood-screen, which divided the nave from the choir. It was so-called because, prior to the Reformation, it was surmounted by a figure of the rood or cross. As a general rule, the upper part of church screens was open, but in cathedrals and large churches the rood-screen was close throughout. These screens, which were constructed either of wood or stone, were very elaborately carved, and also ornamented with painting and gilding.

Screw may be regarded as an inclined plane or wedge wrapped round a cylinder. If a screw has n threads per inch, it is clear that a nut which fits it will move relatively to it through a distance of $\frac{1}{n}$ of an inch, if one is rotated through a complete turn with regard to the other. A lever of some kind (such as a screwdriver or spanner) is usually used to turn the screw or nut; and, if the turning force be so applied

at a radius r inches, this force will act through a distance of $2\pi r$, while the nut or screw moves through a distance $\frac{1}{n}$; the mechanical advantage will, therefore, be $2\pi rn$. In practice about $\frac{1}{3}$ of the applied force is lost in friction. The screw is employed in various mechanical implements and tools, such as the screw-press, screw-jack, etc.; in such cases the relative motion of the screw and its nut is arranged to produce the desired effect. A fine-threaded screw is often used for measuring small distances.

Screw Pine, a plant belonging to the genus *Pandanus* of the order Pandanææ. It derives its popular name from the spiral arrangement of the leaves, which present a distinct resemblance to those of the pineapple. It includes some fifty species, mostly natives of the Malayan, Mascarene, and Seychelles Islands, though a few occur on the continents of Asia, Africa, and Australia. It bears a large, bright orange fruit, insipid to taste, but edible, called "bread-fruit." In India it is sometimes planted to form hedges and to secure the banks of canals. From the scented male flowers of *Pandanus odoratissimus* the perfumers extract the volatile Keora oil, while matting and sacking are made of the leaves of other species. *Pandanus candelabrum* is called the Chandelier Tree, because its branches curve upwards after the fashion of candelabra.

Scribe, AUGUSTIN EUGÈNE, dramatist, was the son of a silk mercer, and was born at Paris on December 24th, 1791. He gave up the study of law, and began to write plays, of which he produced an enormous number, making a very large fortune by his industry. During the ten years following 1821, when he entered into his contract with the Gymnase Theatre in Paris, it is said that he produced no fewer than 150 pieces. Such a turn-out was rendered possible, however, by the Scribe factory, or school, which the master established. One collaborator devised subject, another evolved plots, a third wrote the dialogue, a fourth composed lyrics, and a fifth coined "good things," and the whole then passed through the alembic of Scribe's brain. His most successful pieces were *Bertrand et Raton* (1833), *Le Verre d'Eau* (1840), *La Camaraderie* (1836), and *Adrienne Lecouvreur* (1849). His first play was produced in 1810, but it was not till 1815 that he achieved a notable success. He displayed similar success in writing the libretti for operas, and among the works of this sort for which he was responsible were *Fra Diavolo* (1830), *Robert Le Diable* (1831), *Les Huguenots* (1836), *Le Domino Noir* (1837), *Le Prophète* (1849), *L'Étoile du Nord* (1854), and *L'Africaine* (1865). In 1836 he became an Academician. He died in Paris on February 20th, 1861.

Scribes (Hebrew *sopherim*), a class of Hebrew officials, who appear to have originally exercised military functions. Afterwards the name was applied to those who copied the books of the law. After the return from the Captivity they seem to have been recognised as its interpreters also. Thus the term came to denote a man learned in the law, and eventually the Scribes occupied a threefold position, preserving the body of law and tradition, holding public classes in the Temple, and administering the law in the courts of justice.

Scrivener, FREDERICK HENRY AMBROSE, Biblical scholar, was born at Bermondsey, London, on September 29th, 1813, and educated at St. Olave's School in Southwark and Trinity College, Cambridge. In 1835 he was appointed an assistant master at Sherborne, was curate of Sandford Orcas in Somerset from 1838 to 1845, and was head-master of Falmouth School from 1846 to 1856. Later he held several clerical appointments, and, in 1876, was made vicar of Hendon in Middlesex, where he died on October 30th, 1891. He had made a life-long study of the text of the New Testament, publishing a collation of about twenty manuscripts of the Gospels hitherto unexamined in 1853, and in 1858 an edition of the Greek Testament. His *Plain Introduction to the Criticism of the New Testament*, a standard work, appeared in 1861. He was conservative in his criticism, adhering firmly to the traditional text. But his knowledge was beyond question and he acted as a member of the company of Revisers of the English version of the New Testament (1870 to 1882). In 1872 he was awarded a Civil List pension "in recognition of his services in connection with Biblical criticism and in aid of the publication of his works."

Scrofula (*scrofa*, "a sow") or **STRUMA**, a term which has had various significations at different times, but which is particularly associated with conditions of anæmia and with glandular enlargements such as occur where there is development of tubercular mischief in lymphatic glands. Since knowledge of the local manifestations of tubercle has increased, the term "scrofula" has been less frequently used. Consumptive parents may have strumous children, and children who have exhibited signs of struma are prone to tubercular disease and to other ailments, since their capacity to resist disease is deficient. The glands situated in the neck and under the jaw are most commonly involved. Not only does the swelling occasion a deformity, but matter may form, and, working its way to the surface, produce a sore which, healing with difficulty, may leave a life-long scar. Other scrofulous conditions are inflamed eyes, ulcers on the skin, eczema of the head and elsewhere, affections of the knees, hips and other joints, discharges from nose and ears and enlargement of the tonsils. The treatment must be particularly concerned with maintaining health and strength by a generous

and nourishing diet, which should contain plenty of fatty foods, meat, fresh eggs, milk, cream and digestible vegetables and fruit. Fresh-air exercise should become a regular daily habit, and if children can be reared or educated at the seaside, so much the better. Of strength-forming drugs, cod-liver oil in winter, maltine and iron in summer may be recommended, while Parrish's food is also excellent. Since very little irritation suffices to cause the glands to enlarge (decayed teeth, sore throat, slight eczema may be enough), care must be taken to attend to all such possible sources of irritation at once, with a view to removing them without delay, and so preventing their after-effects.

Scroggs, SIR WILLIAM, Lord Chief Justice, was born at Deddington in Oxfordshire, England, about 1623, and educated at Oriel and Pembroke Colleges, Oxford. He became a member of Gray's Inn in 1641 and was called to the bar in 1653. He was a big, brazen-faced man, of clever speech, a bully and dissolute. He was knighted soon after the Restoration, though it does not appear what he had done to secure the honour. In 1669 he was made a bencher of Gray's Inn, in 1676 was appointed a justice of the court of common pleas, and two years later was promoted Lord Chief Justice of England. During the trials of the victims of the infamous Titus Oates's "Popish Plot," which began in 1678, he browbeat witnesses and prisoners and otherwise did his best to bring the administration of the law into contempt. After about nine months of this bullying he moderated his zeal, and it is supposed that he was bribed to this end by Portuguese gold. In 1680 his arbitrary behaviour effected his ruin. He had suppressed a paper called the *Weekly Packet* and discharged the grand jury before the close of the term. For these and other malpractices he was impeached by the House of Commons, but his trial was always postponed, and in 1681 he was removed from the bench. He died in London on October 25th, 1683. He shares with Bloody Jeffreys the eternal ignominy of being the worst judge that ever dishonoured the English bench.

Scrope, GEORGE JULIUS POULETT, geologist, was born in London on March 10th, 1797. He was the son of John Poulett Thomson, but adopted his wife's surname on his marriage in 1821. He was educated at Harrow and Pembroke College, Oxford, and St. John's College, Cambridge. A holiday at Naples awoke a keen interest in the subject of volcanoes and in geology generally. Every year from 1819 to 1823 he spent many months in Sicily, the Lipari Islands, the Auvergne and the Eifel, and in 1824 was elected a fellow of the Geological Society, of which next year he was appointed secretary along with Mr. (afterwards Sir) Charles Lyell. In 1828 his *Considerations on Volcanoes* appeared and struck a deadly blow at the Neptunists, his standpoint being that of a Uniformitarian. Two years earlier his

Geology and Extinct Volcanoes of Central France had already established his reputation and secured his election to the Royal Society. Science, however, was not his sole hobby, for he threw himself zealously into politics. He was returned for Stroud in 1833, and retained his seat till his retirement in 1868. He was a zealous Reformer, both socially and politically, and a convinced Free Trader. He spoke seldom, preferring to circulate his views on the questions of the day in pamphlet form, a habit that gained him the sobriquet of "Pamphlet Scrope." He received the Wollaston medal from the Geological Society in 1867, and died at Fairlawn, near Cobham, Surrey, on January 19th, 1876.

Scrophulariaceæ, a large order of hypogynous Gamopetalæ, including about 180 genera and 1,800 species. They are mostly herbs, the members of one sub-order, the Rhinanthææ, being often partially parasitic on roots. Their leaves may be opposite or scattered, and are exstipulate and simple. The inflorescence is various, but ordinarily racemose, and the flowers are generally monosymmetric. The lobes of calyx and corolla are four or five in number, and the latter may be perispermate, sub-campanulate, sub-rotate, bi-labiate, or rotate. It is usually conspicuously coloured, pollination being effected by insects. The stamens may be two or five, but are generally didynamous; and the ovary is two-chambered and generally many-ovuled. The fruit is capsular, and the seeds are albuminous. The order is distinguishable with difficulty from the Solanaceæ, Acanthaceæ, and Bignoniaceæ, and is subdivided mainly according to the variations in the imbricate aestivation of the corolla. It includes many favourite garden flowers, such as the snapdragons, fox-gloves, calceolaria, mimulus, pentstemon, and veronica, the interesting British semi-parasitic cow-wheat, eye-bright and red and yellow rattles, etc., but few plants of economic value.

Soudéry, MADELEINE DE, romancist, was born at Havre, in France, on November 15th, 1807, and was left an orphan at six years of age. After being educated by her relatives, she went to Paris and joined the Rambouillet circle, and was considered one of its brightest ornaments. Her brother GEORGES DE SCUDÉRY (1601-67; received at the French Academy in 1650), was a popular writer of portentous fecundity, and it is known that she wrote some of his works. She was very fond of society and pleasure, but always did a considerable amount of writing every day. Her novels or romances, which were extraordinarily successful, are very voluminous, and to the modern reader extremely tedious reading. Even in other countries her *Clélie* (10 vols., 1656), and *Artamène, ou le Grand Cyrus* (10 vols., 1649-53), and other works, were widely read. There is much affectation in them, and the "Map of Tenderness" in the first-named work has been often ridiculed. Her letters, being more natural, are better than her romances. In 1871 the French Academy

awarded her the prize of eloquence for her *Discours sur la Gloire*. She died in Paris on June 2nd, 1701.

Sculpture, the art of producing artistic forms either by cutting wood, stone or other hard material, or by moulding a soft substance such as clay or wax into a desired shape. As an independent art, it is the peculiar province of sculpture to imitate the living form; but when subordinated to architecture it serves the purpose of decoration. For the origins of sculpture one must go back many thousands of years before the Christian era. It is customary to associate the use of sculpture as a fine art with the Greeks of the 6th century B.C., but history proves that the Greek genius developed itself upon lines previously laid down; that it was evolved, in fact, from the Egyptians, Phœnicians and Assyrians of a far earlier date. The sculpture of the early Egyptian civilisation can only be roughly surmised, but that it was practised and brought to an advanced stage of perfection is evident from the Sphinx (*circa* 4000 B.C.), the noblest piece of monumental sculpture in all antiquity, and other colossal monuments in syenite and basalt. It is known also that many Egyptian wall reliefs reached a high standard of art, and that they produced realistic portraiture. Their art, however, having attained a certain degree of excellence, did not advance; it was restricted by hieratic traditions which imposed conventions that retarded its free development. Similarly the Assyrians, whose earliest known monuments date from the 12th century B.C., and whose reliefs of the 8th and 9th centuries may be studied at the British Museum, always remained hampered by convention so far as any rate as the rendering of the human form was concerned. Where their sculpture obtained its highest excellence was in the treatment of animal forms, and it was in their specialisation in this phase of the art that they stood apart from the Egyptian and other antique sculptors. They particularly favoured hybrid forms; both in the treatment of these and of those of a more realistic character they developed wonderful freedom and mastery. The Phœnicians, unlike other peoples of antiquity, scarcely produced any art for the decoration of their own buildings; they were a nation of traders, and the carved work in metal or ivory which they wrought in great abundance was mostly carried by their ships to the many Mediterranean ports with which they had commercial relations. Hence Phœnicia itself has provided but few examples of its own antique art, while other places are rich in treasures of Phœnician origin. The latter specimens, however, show that the Phœnicians borrowed their types both from Egypt and Assyria.

The influence of Phœnician, Egyptian and Assyrian art, especially of the Egyptian, upon Greek sculpture must have been considerable. These peoples had acquired a technical accomplishment in every phase of sculpture long

before the time when the Greek worker was content with the roughest and most primitive method of carving images out of stone or marble; and the provision by them of, so to speak, a ready-made artistic alphabet could not fail to be of great service to the younger nation, struggling to express its ideas but without the means of doing so.

Having acquired this alphabet and assimilated many of the types, etc., of their predecessors in the art, the Greeks proceeded to evolve from this basis an art that was peculiarly their own. Broadly speaking, the difference, observable from the first, between Assyrian or Egyptian sculpture and the Greek is that the intention of the former was to record actual facts and events that had occurred, while the Greek aim was to express the imaginary and typical. As to the earliest Greek artists little is known beyond the mythological stories which were handed down from Greek and Latin writers—the popular tales that assign the lions of Mycenæ and the head of



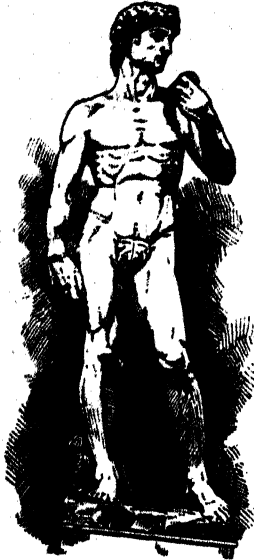
THE VENUS OF MILO.

Medusa at Argos to the Cyclopes, the early statues of the gods to the Telchines, and the first metal work to the Telchines and the Idæan Dactyli. From Pausanias and later writers we learn that Dædalus was the first to open the eyes of statues, to free their arms from their sides and make their legs stride. It is evident, however, that before and for some time after 600 B.C., Greek sculpture was of the most primitive character; the metopes of Selinus (*circa* 600 B.C.), for instance, are uncouth in design, and the Branchidæ figures, attributed to 540 B.C., were merely blocked out. The step from the archaic to the advanced was effected before 480 B.C., the date of Salamis and Plataea, and the next century was the period of highest attainment, the epoch that culminated in Pheidias and the Parthenon. The 4th century produced Praxiteles, Scopas and Lysippus, when the art, no longer content to embody the perfect form of man, was devoted to the further refinement of his beauty and the expression of his moods and passions. During the Hellenistic Age (320 B.C. to 146 B.C.) Greek sculpture degenerated; and in the Græco-Roman period (146 B.C. to A.D. 300) it virtually disappeared, since Græco-Roman work was merely the imitation of Greek work, which was produced for the Roman mar-

ket. The value of these imitations lies in the fact that we are indebted to them for most of our knowledge of great Greek sculpture. The Parthenon of Pheidias, the *Hermes* of Praxiteles, the frieze of the temple of the Wingless Victory, and the *Aginetan Marbles* (ascribed to Onatas), now at the Glyptothek in Munich, are among the few known examples of original Greek work. The *Venus* found in the island of Melos, or Milo, in the *Ægean*, and hence usually called the *Venus of Milo*, is attributed to a Greek sculptor of the Hellenistic period (*circa* 100 B.C.), and, along with the Wingless Victory from Samothrace, is the gem of the Louvre. Myron, Polyclitus and a score of others are only preserved to us by copies of their art. The *Farnese Hercules* is a copy of a Lysippian original, the *Torso Belvedere* of the Vatican is adapted from the same school, and the statues of Argive *Ageladas* and his associates were probably imitated by the *Pasitelean* sculptors of Rome. The *Lacoon*, found in Rhodes, was produced by a sculptor of the Roman period.

From the 2nd to the 4th Christian century Roman sculpture steadily declined, and when the government of the Roman Empire was transferred from Rome to Byzantium, art followed in its train. There arose at Byzantium a local school of painting and sculpture, classical in its origin but quickly becoming tinged with Oriental gorgeousness—a school that was destined to dominate European art for many centuries. To begin with, sculpture flourished to a certain extent; the use of gems and precious metals gave it a kind of superficial splendour that seemed, at any rate to its contemporary patrons, to be an excellent substitute for the classic purity and noble lines of Pheidias. But with the introduction of Christianity, the arts were subjected to an ascetic influence that completely stopped their development. Sculpture, indeed, was for the time being destroyed, since it was considered idolatrous to carve or mould the human form, while even in painting the representation of the latter was limited by a set of rigid conventions imposed by the priesthood. Oppressed by these circumstances, Byzantine sculpture died a natural death, and with it went also the sculpture of most of those countries which were within its sphere of influence. In Italy, however, particularly in North Italy, the art merely underwent a period of inactivity; the genius of the nation, perhaps, did not allow itself to be profoundly affected by the hard religious sentiment that made its mark elsewhere. At any rate, in the 12th century, while painting was still hopelessly burdened by the Byzantine tradition, sculpture awoke in Italy, and the 13th century witnessed the astonishingly modern work of Niccola Pisano and his son Giovanni. The derivation of Niccola's art, as shown in the sculptured panels at Pisa and Siena, was essentially classic, but at the same time it evidenced a naturalistic freedom that might be traced to Gothic in-

fluence; it should be remembered that this was the age when the French Gothic style of architecture and architectural sculpture was attaining the height of its glory in the cathedrals of Chartres, Rheims and Amiens. One modern writer, in fact—M. Marcel Raymond in *La Sculpture Florentine*—claims that



MICHAEL ANGELO'S DAVID.

Niccola's art and that of his followers was inspired wholly by the work that was being done in France. The matter is still debatable. In the 14th century Italian art was enriched by Andrea Orcagna, the author of the Tabernacolo in Or San Michele at Florence; the 15th century brought Ghiberti, Donatello, and Luca della Robbia. Ghiberti (b. 1381) is chiefly remembered by the famous Baptistery gates at Florence, which were begun in 1403. Donatello (b. 1386) is acknowledged to be the greatest sculptor that the Renaissance produced. Considered purely as a sculptor his genius was more perfect even than that of Michael Angelo, whose gigantic personality and power of expressing passionate action and emotion occasionally led him beyond the true limits of his medium. Donatello, while his art had no lack of virility, retained the Greek simplicity, its breadth and its comparative repose. Luca della Robbia is nowadays regarded less as a sculptor than as the founder of the school that produced the beautiful ware associated with his name. Yet one work at least, the "Singing Boys" in the Cathedral Museum, Florence, has stamped his sculpture with sweetness of sentiment, originality and power.

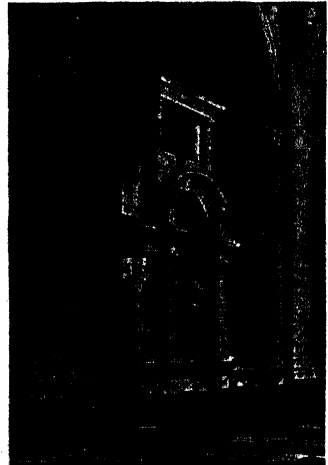
Benvenuto Cellini (1500-71), again, is more closely connected with the art of the goldsmith than with that of the sculptor. With the death of Michael Angelo and the end of the Renaissance interest in Italian sculpture largely passes. Michael Angelo was followed by a race of imitators who left alone his artistic virtues while they exaggerated his vices; this school found its prime apologist in Bernini (1598-1680) who attained great popularity and exercised a singular influence on the sculpture of other countries besides his own. Owing to this and other causes European sculpture during the 17th and 18th centuries

presents but few features of interest. In England, in the 17th century, the only work of importance was the still-life carving of Grinling Gibbons (1648-1721). In the 18th century a Frenchman, Jean Antoine Houdon, proved himself a great portrait sculptor in a style that was neither dry and formal like the pseudo-classical, nor exaggerated and cheap like that of Bernini. France, however, in the 18th century had been invaded by the Italian influence, had remained saturated with it, and Houdon's example had no lasting effect. The advent of Canova (1757-1822) was the signal for a return to the more definitely antique both in France and England. Upon the Italy of his day Canova forced the insipid elegance of his neo-Greek style, while in France Chaudet, Fremiet, Pradier and the Danish Thorwaldsen, and in England Flaxman, followed the general retrogression towards the antique, until sculpture throughout the Western hemisphere had settled down to a correct lifelessness. But in the 19th century there was a revolt against Canova. Then it was that the genius of Alfred Stevens, the sculptor of the much-discussed Wellington Memorial in St. Paul's, rebelled against pseudo-classicism and showed the way to a more living art, while in France Rude, Carpeaux and Barye were forming a school which, with its many diverse elements, was united in its desire for independence.

However, the modern movement in sculpture dates from the beginning of the last quarter of the 19th century. The end of the Franco-German war was followed by a revival of the art in

France. Eugène Guillaume, a skilful if severe craftsman, Paul Dubois, Chapu, Barrias, Falguière, Bartholomé, are some of many names that illumine this epoch; Moreau-Vauthier and Fremiet among the apostles of coloured sculpture. In Germany Rauch and others; in the United States

W. W. Story, Hiram Powers, A. St. Gaudens and Walter Palmer helped to mark a world-wide revival. In England the coming of Jules Dalou, sculptor and political refugee, to the South Kensington Schools, awakened a latent en-



THE WELLINGTON MEMORIAL.

thusiasm among British sculptors; the influence of Carpeaux may be said to have been introduced into England through Dalou. The latter was succeeded in his official position by his disciple, Professor Lanteri. Contemporaneously the teaching of Alfred Gilbert, one of the few successful practitioners of poly-



STATUE OF ST. JOHN THE BAPTIST BY RODIN.

chromatic sculpture, was making itself felt. Much of the inspiration found in the work of living British sculptors has come from France, where, indeed, the majority of British sculptors, as that of British painters, spend a period of their training. But it should be noted that the latest movement in French sculpture—the impressionist movement, of which Auguste Rodin is the accredited chief, though the actual originator is said to have been the Italian sculptor Medardo Rosso—has made little or no headway in the United Kingdom. One finds traces of its influence here and there—in pupils of Rodin, like John Tweed, for instance—but on the whole the English genius inclines, in this art as elsewhere, towards orderliness rather than eccentricity, towards the propriety of the Italian Renaissance and the Greek rather than the experimental and daring.

Materials and Processes. The materials most commonly used in modern statuary are marble and bronze, but in this, as in every age that practised the art, many others have been employed, of which granite, basalt, ivory, wood and terra-cotta may be enumerated. The early Greeks wrought statues of the gods in wood; the shaping of an image in this medium followed

naturally from the regarding of the tree itself as the symbol of this or that deity. Marble, however, from Naxos and Paros, and bronze were the principal materials of the great Greek craftsmen. The first workers in marble probably sketched a front and a side view in outline on the front and side of the block, and then cut out the figure freehand, i.e., without the mechanical aid of a pointing machine; but in Græco-Roman and Hellenistic times pointing from a full-sized model was evidently in vogue, as it is to-day, and in this respect the technical process of marble sculpture can have altered but little during the last 2,000 years. The modern practice in marble sculpture is as follows:—A full-sized model is first of all moulded in clay, and from this a cast is made, generally in plaster. On this cast are marked a number of points, which are then transferred to the block of marble by mechanical measurement, and are drilled in to the depth required; these measured points are known as *puntelli*. After the drilling the superfluous marble is cut away, usually by trained workmen, till the points are reached, when the statue is ready for the surface finishing to be given either by the sculptor or his assistants. Generally speaking, the practice among marble workers is to leave as much to their assistants as possible after the model is once complete. There are, however, several who prefer to work upon the marble with the chisel when it comes to them, rough-shaped, after pointing, and even a few who work freehand from a small, not a full-sized model, and do without the regular system of pointing, in the way that Michael Angelo is said to have done. It is doubtful whether anything is gained by dispensing with any of the mechanical aids to accuracy that are provided by science, and were undoubtedly recognised in principle by the finest sculptors of antiquity. In all departments of the art the antiquity of the processes used to-day is a curious and striking circumstance. Bronze-founding, for instance, which superseded the very ancient practice of beating plates or bars of the metal into shape, is believed to have been known to the Egyptians and to have been introduced into Greece by Rhœcus and Theodorus of Samos; at any rate, it was extensively employed by the sculptors of the 6th century B.C. There are several methods of hollow casting in bronze, all of which were not improbably known to the Greeks, but the principle of all is identical and may be briefly described. A mould is taken from the finished clay model, and into this mould a core is introduced, corresponding nearly to the shape and size of the mould, so that the molten metal will not fill the mould entirely but only the interval between it and the core. In fine casting, everything depends upon the accurate correspondence of the core with the mould, and a mould and core of the required nature can best be produced by what is known as the *cire perdue*, or waste-wax, process. In this the core of some fire-proof

material, corresponding as nearly as possible to the shape of the statue required, but falling within the latter's surface by the thickness which the bronze is to have, is covered with wax to bring it up to the final surface, and the final detailed modelling is added on the wax. Over this the mould is built up; the wax is then melted out and the metal poured into its place. Plaster, while often the material in which exhibition work is shown, is rarely the final form of statuary, neither is the opaque whiteness of its surface pleasing to the majority of eyes. Canova, in summing up the characteristics of various sculptural materials, observed: "Clay is the Life, Plaster the Death; Marble and Bronze the Resurrection." Clay, of course, is the medium most universally adaptable to the modeller's hand, but wax and terra-cotta are frequently used, especially for the lighter species of sculpture, and plaster is occasionally employed for modelling as well as casting. The combination of sculpture with metal work, a movement of which Alfred Gilbert was the initiator in England, has produced many attractive results, though the latter belong rather to the order of *objets d'art* than to that of serious sculpture. Similarly the application of colour to sculpture has been mainly revived by the workers, the art-craftsmen, in wax or terra-cotta or any other material that lends itself to clever and facile manipulation and pleasing effects rather than to the working out of a great conception and a stately result. The ancients coloured their statues, in order to make them more realistic; even after it was discovered that the texture of marble suggested that of human flesh better than anything else, the practice of touching up statues with colour was continued by the Greeks, and this *circumlitio*—as it was called—was esteemed a very high art. Marble, however, undoubtedly gave the deathblow to coloured sculpture, which nowadays only survives in those lighter forms and mediums to which allusion has been made.

Sculptured Stones, a name given to the monumental stones erected in the British Isles during the centuries which followed the introduction of Christianity. The earlier specimens are mostly unheaven and very rude in character. They have been divided into four classes—(1) Those which bear Latin inscriptions in Roman capitals cut into the stone; (2) those in which a Celtic inscription in Ogam characters cut into the stone on one side corresponds to a Latin inscription in Roman letters (usually capitals) on the other; (3) those with Ogam inscriptions only; (4) those with inscriptions in Roman minuscules. This classification of the stones corresponds with their chronological order. The most important examples of the two former classes are found in Wales, of the two latter in Ireland; but all four are represented in England and Scotland also. The incised inscription commemorating the person

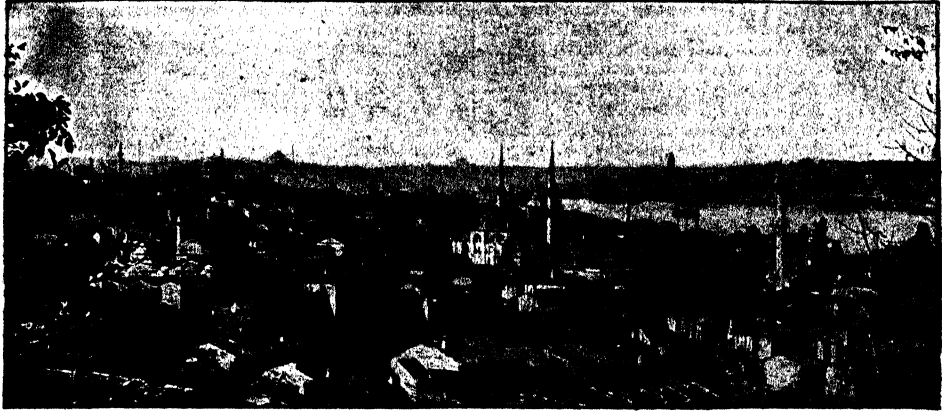
buried at the spot is frequently accompanied by an incised cross, and the stones of the third class are also ornamented with designs in relief of the type common in Celtic manuscripts of the Gospels; in the fourth class, of which there are numerous examples in the cemetery at Clonmacnois, the ornamentation is incised. There are also many sepulchral stones with Runic inscriptions, both Anglican and Scandinavian. The finest examples of this class are cut in the shape of crosses with elaborate ornamentation. That at Ruthwell, in Dumfriesshire, preserves twenty-one lines from an Anglo-Saxon poem, *The Dream of the Cross*, ascribed to Cynewulf, of which no other copy was known before the discovery of a MS. in 1823. The sculptured stones peculiar to Scotland, dating probably from the 7th to the 12th century, seldom bear inscriptions, but they display much rich ornamentation in relief, together with certain symbols (such as the mirror and comb) which do not occur elsewhere and the meaning of which is unknown. Of such crosses, the most beautiful examples occur in Iona and elsewhere in the Highlands.

Scurvy, a disease characterised by debility, bloodlessness, swollen gums, and a tendency to the occurrence of hæmorrhages. It is produced by a deficiency of vegetable diet—as was discovered by Captain Cook, the celebrated navigator—and has from time to time worked much mischief among armies in the field and ships' crews whose diet has not been properly regulated. It is clear that the malady is brought on by the exclusion of fresh vegetables from the dietary, but there is some uncertainty as to the particular elements to the absence of which the disease is attributable. Some authorities say scurvy is produced by the lack of vegetable acids; others by a failure of the adequate supply of potash salts. Since the importance of the adoption of preventive measures has been recognised, the disease has become rare. In the navy lime-juice or lemon-juice is periodically administered to the crews of vessels on long voyages. The efficacy of attention to diet as a radical cure for the disease is demonstrated by a study of the annals of the Naval Hospital at Haslar in Hampshire, in England. In 1780 no fewer than 1,457 cases were admitted into that institution. In 1806 and 1807 there was only a single case in each year; in other words, the mere adjustment of dietary had practically abolished the disease in the experience of one great hospital in a quarter of a century.

Scutari (Turkish, Uskudar; classic, Chrysopolis), a port on the eastern shore of the Bosphorus, Turkey-in-Asia, opposite Constantinople. It is a bright and busy town, containing a seraglio, several mosques (of which the principal are the Mosque of the Dowager Sultana, built in 1547 by the daughter of Solymán; the Great Mosque; the Mosque of Selim III., and the New Mosque), large bazaars and huge but handsome barracks. The cemetery is the most

extensive and most beautiful of any in Constantinople and the vicinity, and, being laid out in Asiatic soil, is, in the eyes of pious Mohammedans, exceptionally desirable as a resting-place. It is estimated that more than three millions of Moslems have already been

violence to the fable if we regard it as a picturesque impressionist attempt to portray the dismay created in the minds of primitive mariners by the hideous aspect and menacing manners of the giant cuttle-fish. A variety of this tradition represents the monster as



SCUTARI.

[Photo: Sebah & Joaillier.

buried there. Adjoining the barracks, on the Bosphorus, is the hallowed spot where 8,000 British soldiers were interred during the Crimean War, the site being now marked by a tall granite obelisk. Near the barracks stood the great red building which Florence Nightingale and her self-sacrificing staff of nurses used as a hospital. Arms, saddles, and fabrics of silk and cotton are largely manufactured. On the rock close to the shore stands the fabled Leander's Tower, now a lighthouse. Pop. variously estimated at from 50,000 to 80,000.

Scutari (Turkish. Scodra: Slav, Skadar), a town of Northern Albania, capital of a vilayet of the same name, Turkey-in-Europe. It is situated near the southern end of Lake Scutari, which is drained by the Bojana, on which the town stands, 10 miles from its mouth on the Adriatic. Manufactures of textiles and firearms are carried on, and there is some ship-building. The exports include grain, wool, hides and skins, sumach and tobacco, and the imports woollen and cotton goods and metals. Pop. variously estimated at 20,000 to 35,000.

Scylla, one of the most familiar figures of Greek mythology. She was the subject of several traditions. According to one, she was the daughter of Crataeis, was a monster who barked like a dog, had twelve feet, six long necks and mouths, each of which contained three rows of sharp teeth, and frequented a rock near Rhegium (modern, Reggio) on the coast of Italy, at the northern entrance to the Strait of Messina. We shall not do

possessed of six heads of different animals, while another endows her with only three. A favourite legend relates that she was originally a beautiful maiden, fond of playing with sea nymphs and beloved by Glaucus, whose passion she did not reciprocate. In an evil moment he invoked the aid of Circe, but she, jealous, cast magic herbs into the pool where Scylla used to bathe, and by these means transformed the innocent girl into a species of mermaid, the upper part of her body remaining womanly, the lower being fish-like or serpent-like, surrounded by dogs. On the opposite, the Sicilian coast, near Messina (modern, Messina), was the whirlpool of Charybdis, and between this vortex, on the one side, and the rocks, on the other, the early navigators had a rough time. The former seems to have been the more formidable and a real danger so long as the undecked boats were in vogue, and it has been asserted that even men-of-war in modern times have been whirled about on the surface of the water by the concentrated force of the eddies. Apparently the perils of the rock, or rocky promontory of Scylla, were greatly exaggerated, there being no reason why this headland should have been more difficult to negotiate than plenty of others of which neither fiction nor fact says a word. Indeed, so far from regarding it as dangerous, Anaxilaus, tyrant of Rhegium, who flourished early in the 5th century B.C., seemed to think it presented possibilities of attack. Therefore, the position being naturally strong, he fortified it and established a naval station at the spot, with the view of holding in check the

pirates of the Tyrrhenian Sea. This led to a small town growing up under protection of the stronghold, though probably it never attained to any considerable size. Pliny, however, called it Scyllæum. The rock is still occupied by a fort. From the rock to the opposite shore the distance is $3\frac{1}{2}$ miles, but the strait is much narrower at the mouth, farther north. The terrors inspired by the difficulties of navigating the strait ultimately found their way into literature, and Scylla and Charybdis found themselves playing the parts of the frying-pan and the fire of the humble proverb. The classical rendering of the indisputable fact that in trying to avoid one danger, or error, or whatever else it may be, we frequently run a serious risk of falling into another just as bad, was expressed in the line from the *Alexandreis* of Philippe Gautier (12th century), *incidit in Scyllam cupiens vitare Charybdin*—"Thou fallest into Scylla desiring to avoid Charybdis."

Scyphostoma, or SCYPHISTOMA, a stage in the life-history of some of the Hydrozoa belonging to the sub-class Acraspeda. It consists of only a small fixed tube resembling the common fresh-water polype or Hydra; it is therefore known also as the "Hydra tuba." It occurs in the members of the Ephyronia.

Scythians, the name of a people well-known in classical times, respecting whose ethnology and habitat considerable doubt still exists. Speaking very generally, they would appear to have inhabited the country familiar to us as Russia-in-Europe and Central Asia, with (possibly) a portion of Siberia. They seem to have been called Scythian by the smaller tribes lying between themselves and the Greeks, but in their own tongue their name was Scoloti. The earliest authorities, if the term be not somewhat unfair, for our scanty knowledge of them were Hesiod, Homer and Herodotus, and though these great men were credulous, they occasionally acquired bits of hard fact. Homer calls them Hippemolgi, in allusion to their characteristic habit of milking mares. Occupying such an enormous area, the people differed considerably amongst themselves, the tribes bordering on civilised races presenting somewhat less rude customs than those more remote, though none degenerated into mere effeminacy. *Æschylus* inferred that the milk-drinking Scythians were *ipso facto* of milder natures than the cannibalistic Sarmatians, who, however, were not Scythians. Where the soil lent itself naturally to cultivation and pasturage, there the Scythians were more settled, and then, as now, certain tracts of Russia possessed extraordinary fertility. The physical features of the vast territory which the Scythians peopled are, of course, quite familiar to us, while to the classical author they were more or less matter of vague conjecture and imagination. Such rivers as the Danube, Dniester, Bug, Dnieper, Don, Volga, Ural, Amu-Daria, Syr-Daria and many more

watered their land, which, but for the Ural Mountains and the rugged masses of Caucasus, Northern Persia, and the gigantic plateaus of Central Asia, was either rich plain, or barren steppe, or arid desert. Thus the people was either migratory (and nomads formed the vast majority) or pastoral. In both cases their habits were savage. They sacrificed to their gods, of whom the war-god, a Scythian version of Mars, was the chief, and to him—whose emblem was an iron sword—they offered up horses, sheep and prisoners. Human beings were sacrificed, but, curiously enough, swine were not sacrificed, nor eaten, nor tolerated in their country. They were brutal warriors, scalping their enemies and drinking out of their skulls. There is growing belief that, to express their racial affinities in current terminology, the Scythians were Turks—in which case, the Turcomans, Tatars, Uzbeks, Yakuts and other Central Asian peoples are descendants—though Niebuhr contended for a still more extensive range for them and claimed they were of Mongolian origin, a theory which would account for their habits and physiognomy, but is probably wider than there is any occasion for. According to a third hypothesis that they are of Indo-European stock, it is surmised that they were the progenitors of the Goths, Germans, and—the Persian Sacæ being the equivalent of Scythæ—Saxons: there is too much mere book-learning and etymology about this theory to carry any weight. But whatever may prove to have been their original race and country, it is small wonder that the Outer Barbarians filled the refined peoples of antiquity with horror, or that, at the hour of Rome's decadence, they overran the empire.

Scytodermata, a synonym of Holothuroidea or Sea-cucumbers.

Sea, the general name for the hydrosphere or water-shell resting in the hollows of the globe and covering about 72 per cent. of its surface, or about 58 per cent. of the northern, and about 83 per cent. of the southern hemisphere. In the hemisphere of which New Zealand is the centre two-thirds of the entire ocean-surface is situated, only 8 per cent. being land. Most of the hydrosphere is a connected whole, the Caspian being the only considerable isolated area of sea or truly inland sea, though there are many nearly land-locked or mediterranean seas. It is usual to divide the hydrosphere into four oceans, the Atlantic, Pacific, Indian, and Southern, the Arctic being considered as part of the first-named. (Geographers opposed to this classification maintain there are five oceans, making the Arctic an independent ocean and not an outlier of the Atlantic.) The Atlantic Ocean thus considered has an area of 33,000,000 square miles, and receives the rivers of half the land area of the globe. It has as more or less enclosed portions the Arctic, Kara, White, Norwegian, North, Baltic, Black, Ægean, Adriatic, Mediterranean, and Caribbean Seas, the Gulf of Mexico, and Hudson

Bay. The Pacific Ocean, the largest in area, covers 55,000,000 square miles, an area equal to the entire land-surface of the globe, and has as more or less enclosed portions the Bering, Okhotsk, Japan, Yellow, China, Celebes, and Arafura Seas, and the Gulf of California. The Indian Ocean covers 17,000,000 square miles, and has the Red and Bengal Seas and the Persian Gulf as partially enclosed areas. The Southern Ocean, extending from 40° S. to the ice of the Antarctic land, covers about 30,000,000 square miles. According to Dr. Robert Brown, in *Our Earth and its Story*, "Efforts have been made to define a certain law in the arrangement and grouping of the basins of the seas. A law, if such is the proper name for it, appears plainly before us in the convergence of the masses of land towards the North and their divergence towards the South. In the land hemisphere (see diagram) the four continents which appear are massive and broad towards the North, but tapering into capes, which give them a wedge-like form, towards the South. Otherwise there are wide differences between them. Europe and Asia are deeply indented by arms of the sea and bays, which form numerous promontories and capes, nearly all of the latter, like the great continents, pointing towards the South." The north of America is similarly indented, but, on the other hand, South America (save at the extreme south), Africa and Australia are distinguished by a remarkably even or comparatively unbroken coast-line. The origin of the sea is, of course, a matter of speculation, since we possess no data whatever enabling us to say for certain how the first rain, now derived from evaporation, began. But since all water comes from the air, either directly or by draining through the soil, we may infer that the sea must have gradually grown in the hollows and wrinkles of the young earth, as its crust contracted in consequence of the diminution of heat at the centre or of the cooling of the globe from a condition of high temperature, the saltiness being due to the rivers and springs, laden as they all are, more or less, with saline and other substances, flowing in and getting concentrated, owing to there being no outlet to the ocean.

Sea-water contains on an average 3.5 per cent. by weight of saline matter, and is, therefore, about 2.6 per cent. more dense than pure water. The saline matter consists of over 77 per cent. of common salt (sodium-chloride), nearly 11 per cent. of magnesium-chloride, an equal percentage of sulphates of magnesium, calcium, and potassium and very minute traces of carbonates of calcium and magnesium and of silica. These salts give to sea-water a bitter as well as a salt taste. Whilst the Baltic is exceptionally fresh, the Mediterranean and Red Seas are the regions of saltiest water. It has been calculated that the salts in the ocean would cover its surface 170 feet deep. Sea-water is aerated by the action of waves at the surface, and dissolved gases being circulated by convection-currents, respiration is

rendered possible for marine organisms at all depths. Sea-water freezes at 28° F., most of the salts separating out in the process, thus yielding nearly fresh ice with more saline water below. The Arctic Sea is mostly frozen over every winter, the floe-ice being from 2 to 10 feet thick; but Sir George Nares, finding floes

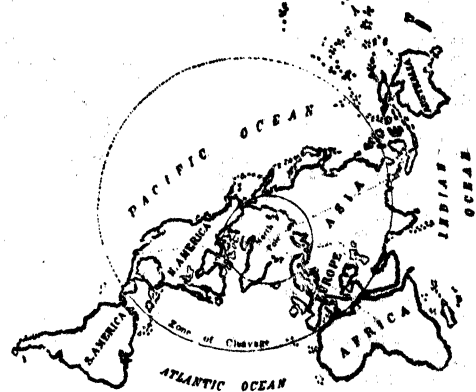


DIAGRAM SHOWING DIVERGENCE OF LAND MASSES AND ZONE OF CLEAVAGE OF THE EARTH.

over 150 feet thick, estimated that they might be five hundred years old, and named that part of the Arctic the Palaeocrystic Sea. In the tropical zone the surface-water has an annual temperature exceeding 80° F., but in the Red Sea 90° and 100° have been recorded. At 300 to 400 fathoms below the surface a temperature of 40° is common in all latitudes, whilst at greater depths it is only in polar regions that the temperature falls below 30°. Sir John Murray considers half the globe to be covered with water over 10,000 feet deep. This he terms the abyssal area. About 22 per cent. of the surface, covered by more shallow water, he terms the transitional area, the remainder being the permanently continental, or land, area. The average depth of the sea is 2,100 fathoms (12,600 feet), one of the deepest abysses—that known from the United States exploring vessel as the *Tuscarora Deep*, between 20° and 50° N. in the Pacific—almost reaching 4,700 fathoms, although there is a record of 5,269 fathoms at a point east of the Ladrone Islands. The movements of the sea include tides, waves due to wind, currents of surface water, due mainly to the constant winds, and circulation by convection-currents, produced by concentration by heat in the tropics, and by freezing in polar seas, by dilution with fresh water, and possibly by other causes affecting temperature. The sea equalises temperatures, keeps up breezes and monsoons, supplies the atmosphere with its water-vapour, is constantly tending by its waves and shingle to wear down its coasts to a plane, and is the receptacle, not only for ter-

rigene deposits formed from the wear and tear of the land, but also for pelagic deposits, or oozes, formed in deep water, far from land, by the slow accumulation of minute organism, decomposed pumice, and meteoric dust. The terrigene deposits, besides gravels and sands, consist of muds, including coral mud, volcanic mud, and widely-distributed blue mud, coloured by iron sulphide and ferrous oxide, and green mud, coloured by glauconite. The pelagic deposits include the oozes known, from their prevailing organisms and colours, as the pteropod ooze, the Globigerina or white ooze, and the straw-coloured or radiolarian and diatomaceous oozes, of which the two former are mainly calcareous, and the two latter mainly silicious, together with a very ubiquitous red clay, which covers half the floor of the Pacific. This consists of the residue of dissolved Globigerina ooze, of waterlogged pumice and of meteoric and volcanic dust, and contains manganic nodules, crystals of zeolites, and numerous slowly-encrusted shark's teeth.

Though it was once believed that the bottom of the sea was analogous to the surface of land and had hills and glens, mountains and valleys, deep-sea exploring expeditions have modified this view. It is true that for some distance from a land mass, the floor of the sea is practically a continuation of the shore, but beyond the boundary the ocean bed, as a rule, exhibits few rapid inequalities. Here and there the lead may sink into deep holes, or even apparently bottomless pits, but, generally speaking, the floor displays gentle undulations, recalling the aspect of a terrestrial rolling plain, the soundings for, perhaps, a hundred miles at a stretch indicating very little difference. Nevertheless, in the Atlantic are several extensive plateaux, along one of which the cables are laid, and this is true also of areas in the other oceans. The colour of the sea is another interesting point. In the open ocean, away from the operation of all land and river influences, the colour sometimes changes rapidly from blue to green and then back to blue. Investigations prove that the natural hue of all water is blue ("ultramarine") and that the divergence is due to the admixture or presence of foreign ingredients. There is a close connection between colour and salinity, the specific gravity of blue water being always heavier than that of green, the latter, therefore, containing less salt. There are occasional exceptions, however. Tropical seas are usually intensely salt and polar seas fresh, but green stretches are sometimes found in the Tropics and blue seas in the Arctic regions.

Sea-Anemone. [ACTINIA.]

Sea-Bear. [SEAL.]

Seabury, SAMUEL, first Bishop of Connecticut, was born at Groton, Connecticut, United States, on November 30th, 1729, and was educated at Yale, where he graduated in 1749.

He then studied theology under his father, a Church of England clergyman, and later medicine at Edinburgh University. He took holy orders, being ordained in London in 1753. After his return to his native land he engaged in missionary work for a few years and became rector of Jamaica, Long Island, in 1757, and, ten years later, was preferred to Westchester, New York. Here his views were obnoxious to the strait-laced Whigs, by some of whom he was cast into prison in New Haven for six weeks. On his release he supported himself for a time by the practice of medicine. He was still in bad odour, because of his sympathies with the mother country in her controversy with the colonies. In 1777 he received the degree of D.D. from Oxford, and in 1783 the Church of England clergy of Connecticut elected him first bishop of the diocese. After waiting nearly sixteen months in vain for consecration in London, he applied to the Scottish episcopate by which he was consecrated at Aberdeen in 1784. He carried on the duties of his office with zeal and efficiency, and was the first president bishop of the convention of State churches, held in 1789, and, along with Bishops Provost, White, and Madison, consecrated Bishop Claggett, through whom every bishop of the Anglican Communion afterwards consecrated in the Union traces his episcopate. He died in New London, Connecticut, on February 25th, 1796.

Sea-Cucumber. HOLOTHURIANS.]

Sea-Fir, or *SERTULARIA ABIETINA* (Linn.), is a species of zoophyte belonging to the family of Sertulariæ and the order Hydroidea. As it is one of the commonest members of this group, the popular name is sometimes extended to include them all, such as the Seetamarisk (*Diphasia tamarisca*, Linn.), the Seapine Coralline (*D. pinaster*, Ell. and Sol.), the Poddied Coralline (*Aglaophenia pluma*, Linn.), and others. The group are all marine, and are plant-like in form. The skeleton is horny or chitinous, repeatedly branched, and is attached to rocks and shells. The zoophyte is colonial, many different polypites or individuals uniting to form a fixed colony or hydrosoma. This is composed of a chitinous or horny crust known as the perisarc, which surrounds and protects the softer tissues. Each polypite is protected by an expansion of the perisarc forming a cup or hydrotheca. The polypites are of two types of structure; they are modified to serve either for nutrition (the hydranths), while another set (the gonothecæ) serve for reproduction. The skeleton consists of two parts: the basal hydrorhiza by which it is fixed, and the hydrocaulus, or the erect branching stem; the two form the hydrophyton. In some genera, otherwise resembling the Sertularians, there are no hydrothecæ to protect the polypites; these form the order Athecata, while the Sertularians belong to the order Thecaphora. The Campanularians are

familiar representatives of the former. The Sea-firs and their immediate allies are marine.

Seaford, a watering-place on the coast of Sussex, England, 12 miles E. by S. of Brighton. In consequence of its excellent golf links and bracing climate the town is in growing request as a health-resort. A singular incident in its physical history is said to have occurred in 1570. Before that year the river Ouse had fallen into the sea at the cliffs, but during the prevalence of an extraordinary storm its waters were held up, driven back and permanently diverted into another course, now reaching the English Channel at Newhaven, fully two miles to the west. The parish church of St. Leonard (restored in 1861-2) is a good example of the Early English flint-and-stone structure. Prawns are caught among the rocks and the fisheries (of mackerel especially) provide the only considerable industry. Pop. (1901), 2,615.

Seaforth, **LOCH**, an arm of the sea, on the south-eastern side of the island of Lewis, Outer Hebrides, Scotland, forming part of the boundary between Lewis and Harris. It extends inland for 13 miles, and its breadth ranges from a quarter of a mile to three miles. For more than half the distance from the sea it runs towards the north-west, where it encloses an island of considerable dimensions; it then bends north-eastwards and ends in an easterly and a westerly branch, the former three miles in length, the latter one mile. At its seaward end it is bounded by lofty hills which render the scenery somewhat impressive. The upper part lies within the parish of Lochs, a parish appropriately named from the great number of lakes within its area. The loch is associated with a famous Highland regiment. In 1783 Francis Mackenzie Humberston (1754-1815) succeeded to the Seaforth estates and the hereditary chieftaincy of the clan Mackenzie. In 1787 he offered to raise a Highland regiment for service in India, but his recruits were drafted instead to complete the 74th and 75th regiments. He renewed his offer twice: the first time it was refused, the second (1793) accepted. Then he set about raising the Ross-shire Buffs, which were enrolled as the 78th Foot, being the third Highland regiment that had borne that number. The regiment is now the 2nd Seaforth Highlanders. In 1797 Humberston was created Lord Seaforth and Baron Mackenzie of Kintail. The Mackenzie, however, had been created Earl of Seaforth in 1623, but the title was forfeit in 1716, on account of the then holder's Jacobite proclivities.

Seagull. [GULL.]

Seaham Harbour, a seaport, Durham county, England, 6 miles S. of Sunderland. It is mainly noted as the place where the Marquis of Londonderry carries on the trade of coal merchant. The town dates from 1828, when the first stone of the north pier was laid by the 3rd Marquis. At that time the district was

bleak and practically uninhabited. It now flourishes, the mining and export of coal being the leading industry, though there are also manufactures of bottles and chemicals in addition to iron-founding. The principal buildings are the Perpendicular church of St. John the Evangelist, the Londonderry Literary Institute in the Doric style (built in 1855 by the 3rd Marquis), the Masonic Hall, the Gothic infirmary, and the cupola-crowned colliery offices. The harbour contains wet and dry docks and a tidal basin and has a lifeboat station. At Seaham Hall, in the vicinity, a seat of the Marquis of Londonderry, Lord Byron was married on January 2nd, 1815, to Anna Isabella, only child of Sir Ralph Milbanke Noel and Baroness Wentworth. Pop. (1901), 10,163.

Sea-Horse. [HIPPOCAMPUS.]

Seakale (*Crambe maritima*), a British seaside perennial plant belonging to the order Cruciferae, with broad wavy glaucous leaves, and white, honey-scented flowers. Though used in ancient times and by inhabitants of the coast, it was only introduced into the kitchen garden in the early part of the 19th century. It is earthed up, and the blanched stems and leaf-stalks are eaten boiled.

Seal, a die, or matrix, of gold, silver, bronze, lead or other metal, or some other hard material, such as rock crystal, cornelian and sard, on which is engraved a device or motto to be stamped either on paper or on clay, wax or some other substance in a plastic state, to denote the source from which a document proceeds; the word is also used to signify the actual impression which is thus produced. In earlier times the seal was of exceptional importance, since it indicated the validity of the document bearing it. It was either *plaqué*, that is, impressed (the more usual form) or pendent. The ancient Egyptians frequently had seals attached to their rings, and the practice of sealing passed from them to the Romans. The *bullae* or impressions on lead introduced by the emperors who succeeded Constantine were likewise used as signatures by the Popes, who fastened them to documents with bands of silk or wool: from the latter usage arose the use of the word "bull" for a Papal charter. With a view to preventing fraud, or improper use of the seal, the matrix (as in the case of that of the monastery on Mount Athos) was sometimes in four parts, each being in the custody of a different person, all united by the key-handle, which was entrusted to the keeping of a fifth person. In such cases, therefore, the seal could only be employed in the presence of five separate persons—an ample safeguard. The seals of the French kings from the Merovingian period downwards form an interesting collection. In England under the Norman kings a seal affixed to a deed became a legal proof of its authenticity. It is still required to give validity to an instrument conveying real estate, but as sub-

scription is also necessary the process of sealing is merely formal. Corporate seals have been used by towns and boroughs since the 13th century. The Great Seal of the United Kingdom is the emblem of sovereignty, and is used on all solemn occasions when the will of the sovereign is to be expressed. It is very

on them at parting all the evils of anarchy." So he burned the writs for the new Parliament and concealed the Seal. The Great Seal was once actually stolen. On the night of March 24th, 1784, thieves broke into the house of Lord Chancellor Thurlow in Great Ormond Street, London, and stole the Seal. They must



GREAT SEAL OF HENRY V.

ornate, the Great Seal of Henry V. being probably the most magnificent of the English Royal series. A new Great Seal is provided by the king in council at the beginning of each reign or whenever a change is made in the royal arms or style, the old one being publicly broken. It was introduced into England by Edward the Confessor, who committed it to the care of the Chancellor. When the office of Chancellor was vacant through death or resignation, the Great Seal was placed in the hands of a temporary keeper, who gradually came to exercise all the functions connected with its use. Since the accession of George III. the office of Lord Keeper has been discontinued. The Great Seal was also occasionally placed in commission. By the Act of Union with Scotland one Great Seal is used for the United Kingdom in all matters of public import, but the Act of Union with Ireland contained no similar provision. Although extreme care is always taken of the Great Seal, it has not escaped the element of romance. Early on the morning of December 11th, 1688, James II. fled from Whitehall Palace, carrying the Great Seal in his hand. While he was being ferried across the Thames from Millbank to Vauxhall, he flung the Seal into the river, whence it was accidentally fished up many months later and restored to the authorities. The act was childish and spiteful, for probably Lord Macaulay's theory is correct. "The tyrant," he wrote in his *History of England*, "pleased himself with the thought that he might avenge himself on a people who had been impatient of his despotism by inflicting

have consigned it to the melting-pot (it was of silver), for it was never seen again. The Privy Seal is affixed to letters-patent for the grant of charters, etc., before they come to the Great Seal, and to documents of minor importance which do not pass the Great Seal at all. The office of Clerk or Keeper of the Privy Seal, now called Lord Privy Seal, is of Norman origin. In the reign of Henry VIII. the Privy Seal was made the warrant of the legality of letters-patent from the Crown, and authorised the Lord Chancellor to affix the Great Seal. By the 47 & 48 Vict., cap. 30, however, a warrant under the royal sign-manual, regularly countersigned, has taken the place of the Privy Seal as an authority for affixing the Great Seal.

Seal, a general name (in many cases with an epithet) for any of the Pinnipedia or Fin-footed Carnivora, with the exception of the Walrus. All are aquatic and nearly all marine, but some enter large rivers, and two species are found in inland lakes (Baikal, Caspian Sea and Aral in Asia, and Ladoga in Finland). The limbs bear five digits united to the extremities by a strong web, and are modified to form powerful swimming organs. The tail is always short. Seals are widely distributed, but are most abundant in the cold and temperate regions of the northern and southern hemispheres. They feed on fish, crustaceans and molluscs. There are two families—the *Otariidae* or Eared Seals, forming a connecting-link with the Land Carnivora, and the *Phocidae* or True Seals. In the Otaries there is a small external ear, and on land the hind limbs are

directed forwards, thus acting as supports for the body; while in the True Seals they are directed backwards. The palms and soles of the Eared Seals are naked; those of the True Seals are covered with hair. The Eared Seals are natives of the North Pacific and the South Atlantic coasts, the Cape of Good Hope, Australia, and some of the neighbouring islands. They are popularly known as Sea-bears and Sea-lions, according as they do, or do not, possess the close under-fur which forms the "seal-skin" of commerce. These animals form herds. The males are always much larger than the females, and are polygamous. They are now usually grouped in one genus (*Otaria*), though formerly broken up into several genera. Of the Sea-lions, sometimes called Hair-seals to distinguish them from the Sea-bears or Fur-seals, the best-known and the largest is the Northern Sea-lion (*O. stelleri*) from the North Pacific. The natives of Kamchatka have a curious mode of catching them. Salmon swarm in summer off the mouths of the rivers and the Sea-lions follow the fish. But the river mouths have been staked with strong nets, the meshes of which are large enough to pass the salmon, and the pursuing Sea-lions, becoming hopelessly entangled, are despatched by the Kamchatdales, who approach in flat-bottomed boats and kill their victims with bone clubs. The Patagonian Sea-lion (*O. jubata*) was first brought alive to Europe in 1866. A French sailor named Lecomte secured a specimen and sold it to the Zoological Society of London. When this animal died, Lecomte went out to the Falkland Islands for other specimens, one only of which arrived safely. This animal exhibited great docility and intelligence, and was taught some amusing tricks by its keeper. The existence of the mane from which the animal takes its name has been doubted; but it is presumed that J. R. Forster, who also named it after Captain Cook, with whom he sailed. Cook's Otary, saw larger and more rugged specimens than are now met with which wore a shaggy mane, as he described. The Californian Sea-lion (*O. californiana*) has frequently been brought to Europe. The Fur-seal or Common Sea-bear of the North Pacific (*O. ursina*) has its chief home in the Pribiloff Islands, where it breeds. These islands, situated in Bering Sea, to the north of the Aleutians, were discovered in 1786 by Captain Pribiloff and became a station for Russian fishers until they were ceded to the United States. The adult male is from 6 to 7 feet long, and the female about 4 feet. The breeding-places are known as "rookeries"; the "bulls" come on shore about the end of May or the beginning of June, and the mating begins as soon as the females arrive, each bull securing as many mates as he can. By the middle of September the young have learned to swim, and the rookery is deserted till the following breeding season. The Pribiloff Islands were acquired by America from Russia in 1870, and the assumption of sovereign

rights over the Bering Sea by the United States Government gave rise to complications with Great Britain, which were settled by the Convention of 1893. By this convention the take of seals was regulated; but killing in open sea prevails to such an extent that it is probable that in the near future the northern Fur-seal will be as scarce as its southern congener (*O. pusilla*), the Cape Fur-seal, which is said to be on the verge of extinction. The Falkland Island Fur-seal (*O. Falklandica*), found not only on the islands within the Antarctic Circle, but also on the mainland around Patagonia and Cape Horn and the Chile islands, furnishes one of the most valuable



THE COMMON SEAL.
(*Phoca vitulina*.)

of the skins in the market. Even ashore their agility is remarkable, but Captain Weddell, who explored the region in 1818-21 in an expedition to the South Pole, explains the ridiculous story of their throwing stones at their pursuers with their tails by the awkward trailing gait of the animals, which, as they flounder to the sea, scatter debris of rocks to right and left in their panic scamper. The males are from 6 to 7 feet long, the females seldom exceed 4 feet. The True Seals constitute the family *Phocidae*, and are much more aquatic than the Eared Seals. On land their hind-limbs afford them no assistance, and their progression is a series of jumps, aided in some cases, to a small extent, by the fore-limbs. But however ungainly their movements may be on shore, the animals are grace itself in their native element. The Common Seal (*Phoca vitulina*) is found on the European and American shores of the Atlantic and in the North Pacific. Round the British and Irish coasts

it is fairly common "in all suitable localities, from which it has not been driven away by the molestations of man." The usual length is from 4 to 5 feet; greyish-yellow in colour, with dark spots, on the upper surface, and lighter below. The creature is readily responsive to music, a flute, or even a whistle, bringing it to the surface. Its docility has been observed since the days of Pliny, and one kept tame in Shetland even left the sea when called by name by its owner. One day, however, during a sudden snowstorm a number of wild Seals appeared and coaxed it to join them, and it was never more seen or heard of. To the same genus belong the Harp Seal (*P. grælandica*), the Ringed Seal (*P. hispida*), the Bearded Seal (*P. barbata*), and the Seals of the Caspian and Aral Seas (*P. caspica*) and Lake Baikal (*P. sibirica*). Most of them are hunted for the sake of their skins, blubber (which yields a valuable oil), and flesh. Sir W. H. Flower put the take of Greenland Seals by the Scots, Dutch, and Norwegian sealing vessels at 200,000 annually, but such a catch is hardly ever approached now. The Ringed Seal, which derives its other scientific name of *Phoca fatida* from the strong, if not disgusting, odour exhaled by the old males, or an intimately-allied species, is said to be found in Lake Baikal and Lake Ladoga, but there is a conflict of authorities on the point. Dybowski and Nilsson maintain that *P. sibirica* and *P. caspica* are distinct species, while A. R. Wallace, Van Beneden and Dr. James Murie are disposed to regard them as identical with the Ringed Seal, on the ground that they are descendants of the animals that haunted the waters of Russia-in-Asia at a remote epoch in the history of the globe, when there was probably direct communication with the Arctic Ocean. The Grey Seal (*Halichærus grypus*), larger than the Common Seal, seems to be confined to the North Atlantic, and occurs on the British coasts. The Danes are trying to exterminate this species on account of the harm it does to their fisheries. The Monk Seals (*Monachus*) inhabit the warmer seas. One species (*M. albigenter*) is Mediterranean, and *M. tropicalis* West Indian. It is the "talking fish" of the showman, being of so teachable a disposition that it will "shake hands," kiss the spectator, utter sounds that a showman's imagination easily takes for speech, and go through several simple tricks. The Common Sea-leopard (*Ogmorhinus leptonyx*) and Weddell's Sea-leopard (*Pacilophoca weddelli*) inhabit southern temperate seas and the antarctic regions. The Hooded or Bladder-nosed Seal (*Cystophora cristata*), a native of the Polar seas, is remarkable for a dilatable sac on the face of the male, which can be inflated at will, and then extends backwards, covering the upper part of the head. The Elephant Seal (*Macrorhinus leoninus*), from southern seas and the coast of California, is the largest of the family, adult males being nearly 20 feet in length, while the females are much smaller. In

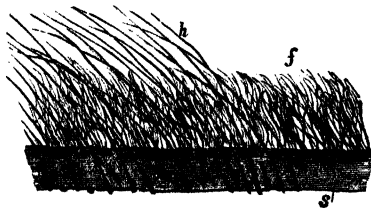
other genera there is little difference in the sexes in point of size. The full-grown males have the snout produced into a kind of trunk, which can be dilated and extended at pleasure. This animal is hunted for its blubber and skin.

Sealed Orders are the orders handed to the commander of a vessel or fleet sealed up and not to be opened until he has reached a certain point at sea, indicated before sailing. They are seldom used excepting in the case of manœuvres or in time of war when it is necessary to maintain strictest secrecy even from the commander as well as from the enemy. Such a contingency would scarcely ever happen now in the event of the British Navy, or any squadron of it, being engaged in hostile operations.

Sealing-Wax does not now contain any wax, as its name would imply, though in former days when sealing was in far more general vogue and it was important the material should be of the best quality, beeswax was an ingredient. Coarse varieties are made from resins, which are thoroughly melted and then, in a molten condition, coloured with red-lead, vermilion, or other pigment according to the colour desired, the sealing-wax being cast in moulds and allowed to cool. These inferior waxes, however, can only be used for rough purposes, such as the sealing of bottles and the doing-up of parcels, as they are somewhat brittle and are not very viscid when heated. The better varieties contain shellac in place of the resin.

Sea-Lion. [SEAL.]

Seal-Skin. All the Sea-lion family possess, at least in their early years, under-fur, though it is sparse in some and thick in others, becoming very abundant in the latter as age

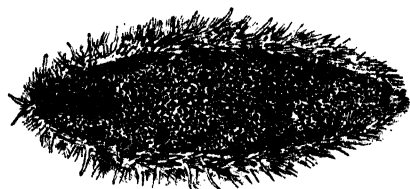


SEAL-SKIN.

advances. If a seal-skin jacket be examined, its rich colour, velvety softness and the denseness of the fur will be obvious at once, but these qualities are the result of treatment. As imported, the dry skin is coarse, hard and salted. In the living animal there are, so to speak, two growths of hair—a long, coarse, oily-looking hair and a short, fine hair near the roots of the other: the latter is the under-fur. In the first stage of dressing the under-fur is revealed after the following process, as described by Dr. James Murie, has been gone through:—The skin having been washed free

from grease and other impurities, is stretched out, fleshy side upwards. A sharp, flat knife is next passed to and fro across the flesh-substance, thinning it somewhat. In the course of this handling the blade severs the roots of the long coarse hairs, which penetrate more deeply than those of the soft delicate underfur. The rough hairs can now easily be got rid of, while the fur retains its hold, its roots not having been affected by the dresser's knife. Only workmen of proved dexterity and care are employed in this operation. The next steps are more or less evident. The pelt is softened and preserved and, when no further manipulation is needed, the fur is dyed the deep uniform tint of rich brown so universally admired. It is during the dyeing, however, that the fur loses its natural curly character. The accompanying diagram of a vertical section of the skin of the Fur-seal shows how the coarse hairs (*h*) penetrate quite through the skin (*s*), while the roots of the fur (*f*) are comparatively superficial.

Sea-Mouse (*Aphrodita aculeata*), a marine worm belonging to the family Aphroditidae, of the sub-order Errantia, of the order Polychæta, of the class Annelida. This "very wormlike animal," as Professor P. Martin



SEA-MOUSE.
(*Aphrodita aculeata*.)

Duncan called it, ranges in length from four to eight or ten inches and is from one to two inches broad. Its back is covered with a great number of scales, or elytra, concealed by a covering of fine bristles and, in the sun, reflects all the colours of the rainbow. It is oval in shape. It moves about by numerous pairs of feet, protected by long bristles or setæ. There are four small eyes and its head is furnished with feelers or tentacles. It swims pretty quickly, frequents fairly deep water, and feeds on invertebrates. It is common on the south coast of England.

Sea-Pen. [PENNATULIDA.]

Sea-Pie. [OYSTER CATCHER.]

Search Warrant, an authority granted upon information or complaint made in writing and upon oath, empowering the person to whom it is addressed to search a house or other place therein specified, against anyone suspected of treason, felony, or any indictable misdemeanour, or to search for stolen goods. When the warrant is received by the officer, he is bound to execute it in any place to which the

jurisdiction of the magistrate and himself extends, and he may break open doors in order to execute it. (See the Larceny Act, 24 and 25 Vict. c. 96.)

Sea-Serpent. The idea that a gigantic marine serpentiform animal exists appears in the works of old naturalists, but with such manifest exaggerations that their accounts of it may be dismissed as throwing little or no light on the subject. There is, moreover, scarcely any doubt that some of the appearances which have given rise to sea-serpent stories have been due to schools of porpoises at play, floating weed rising and falling with the waves, or flocks of sea-birds, all of which may convey the impression of undulatory or serpentine motion. But accounts have been given by persons who claim to have had a view of the sea-serpent at close quarters, and these seem to establish the fact that the ocean depths contain gigantic creatures resembling, or presenting the appearance of, monstrous snakes. First in point of time comes the story of Captain McQuhae, of H.M.S. *Dadalus*, who, in his voyage home from the East Indies in 1848, sighted an enormous serpent with head and shoulders kept about 4 feet above the water, and there were about 60 feet of the creature visible, no part of which was used in propelling it through the water. Sir Richard Owen thought that the creature was an enormous seal, and a similar theory has been put forward more recently by a Dutch naturalist to account for all sea-serpent stories; but a seal of those dimensions, or anything approaching to them, would be almost as remarkable as the alleged marine monster itself. Lieutenant Haynes, of the royal yacht *Osborne*, saw a sea-serpent off the coast of Sicily in 1877 (*Graphic*, June 30), and since then two or three other instances have been recorded. In September, 1893, Richard Lydekker, when off the coast of Brazil, witnessed a finner whale attacked by killers (*Orca gladiator*), and apparently worrying the whale beneath the surface was what he took to be a "gigantic shark, allied to the thresher, but of a white colour, and probably armed with much larger teeth." He adds, "If so, we have evidence of a fish at present unknown to science." (*Natural Science*, March, 1894.) At the same time one would hesitate to describe the assaults of a shark as of a worrying nature, its mode of attack being as direct as it is deadly. What the sea-serpent is cannot be decided without further evidence. There is, of course, no reason, *prima facie*, why the depths of the ocean should not shelter some altogether horrible creature—*ingens, vastum et informe*—but to grant this much is obviously very different from the demonstration of the existence of such a monstrosity.

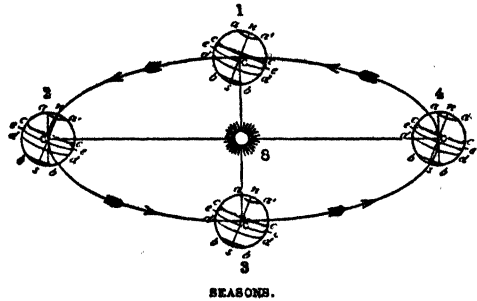
Sea-Sickness. The symptoms of this malady are headache, giddiness, vomiting, and prostration. The transformation from the enjoyment of perfect health to a condition of absolute dejection, and the usually equally rapid recovery,

which are the phenomena presented by sufferers from this disease during, and after, a short sea passage, constitute a remarkable sequence of events, and it is not a little astonishing that the movements of the vessel, which produce such a profound impression upon those who are susceptible to sea-sickness, should cause no discomfort whatever to certain fortunate persons. During long voyages, when vomiting repeatedly occurs, a condition of collapse supervenes which has in rare instances proved fatal. On the other hand, some persons in similar circumstances only suffer discomfort for a short period, a state of tolerance of the unusual conditions becoming established. Numerous theories professing to explain the cause of sea-sickness have been formulated. One of the most probable views enunciated is that which attributes the symptoms to the disturbance set up in the semicircular canals of the ear by the movement of the ship. These structures are supposed to be concerned with the notions entertained by the individual as to his space relationships, and abnormal impulses transmitted by them to the brain, and thence reflected along the gastric fibres of the vagus, may play an important part in the causation of the malady. There is, moreover, very little doubt but that many persons, especially those of nervous temperament, predispose themselves, so to speak, to an attack of sea-sickness, by thinking about it and its tortures even before the vessel has left port. If they would school themselves to think of anything else but *mal de mer*, it is possible they might, if not at once, yet ultimately, come to face a sea trip not only with impunity, but with positive enjoyment. As regards treatment, innumerable specifics have been recommended, a sure indication that no one of them is completely efficacious. Probably the best plan to adopt for those who are reluctantly compelled to undertake a short voyage is to eat a good meal three or four hours before embarking, and to lie down or sit still while on board. If it is possible to remain on deck and near the centre of the vessel so much the better. A mixture of chloral and bromide of ammonium, administered half an hour before the vessel starts with a view to securing sleep, has been recommended. In serious cases, with persistent vomiting, this remedy may be employed, and if collapse is extreme, stimulants must be administered, and medical advice procured. The use of a tightly-applied abdominal belt, or of an icebag to the spine, has been advocated, and this latter method has, it is said, produced good results in prolonged cases.

Sea-Snake, a snake belonging to the family Hydrophidae, from the Indian and Australian seas. The body is flattened, and the tail acts as a swimming organ and rudder. Their nostrils open outwards and are closed with a valve. These snakes, some of which attain a considerable size—according to Günther, some examples attain a length of 12 feet but the

longest Sir Joseph Fayerer ever saw did not exceed 5 feet—are intensely venomous, and feed chiefly on fish. When cast on shore, they are helpless and nearly blind, though this would seem to be a condition consequent on their change of element, since they pursue and overtake their prey in salt water, which implies somewhat keen sight. In point of fact, the eyes are small, with circular pupils, and contract to such an extent when the snake is removed from the water that the animal is practically almost blind. They are occasionally seen in great numbers in the Bay of Bengal, their movements in the clear blue water being agile, graceful and beautiful. Their bite is extremely deadly. Fayerer mentions the case of a fisherman who died within 75 minutes of being bitten.

Seasons. If the earth were to rotate about an axis perpendicular to the plane of her path round the sun, at any position which she might



occupy the whole of one hemisphere stretching from pole to pole would remain for twelve hours under the sun's influence, and would be turned away to the darkness of space for the other twelve hours. Every day would be exactly like every other day; the equator would always be the hottest portion of the earth, since it would always have the sun vertically overhead; and the poles would always be the coldest spots, as they would receive the most oblique rays. But the axis of the earth's rotation is not perpendicular to the plane of her orbit (the ecliptic), but makes an angle with it of $66\frac{1}{2}^\circ$ and remains pointing in the same direction, or parallel to itself, all through the year. The above diagram may be taken to illustrate the position of the earth on March 21st, June 21st, September 23rd, and December 21st. In position 1 the radius $s c$ of the earth's orbit is perpendicular to the axis, $n s$. Light from the sun then falls vertically upon the equator, $e e$, and every spot on the earth enjoys equal day and night. This is the vernal equinox. In position 2 the line $s c$ is perpendicular not to $n s$ but to $a b$, a line inclined at an angle of $23\frac{1}{2}^\circ$ to $n s$, and the sun is not vertically above the equator, but is over $c c$, the Tropic of Cancer, a circle parallel to

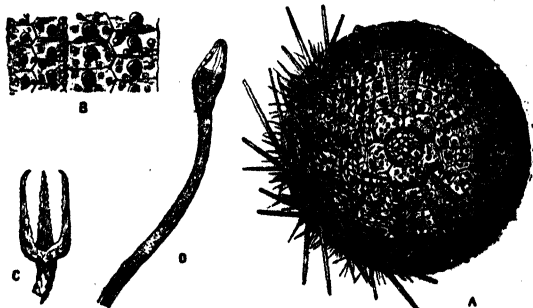
the equator and $23\frac{1}{2}^{\circ}$ north of it. Every point in the northern hemisphere is now having a day more than twelve hours long, is receiving more heat from the sun, and the summer season is in progress. If a circle, $a\ a'$, be drawn $23\frac{1}{2}^{\circ}$ from the pole n , it will be seen that no point north of this circle is ever in darkness, since every point rotates about the line $n\ s$. At the summer solstice, therefore, there is perpetual day within the Arctic Circle, as $a\ a'$ is called. It is to be remembered that the sun is so far away that his rays light up a complete hemisphere, the external rays touching the earth round the circle $a\ b$. In position 3 the sun is again vertical to the equator, equal day and night prevail everywhere, and the earth is at the autumnal equinox. Position 4 represents the earth at the winter solstice, when we have the conditions of 2 reversed. What was then true of the northern hemisphere is now true of the southern, and *vice versa*. $s\ c$ is perpendicular to $a\ b$, but every point in the Arctic Circle is now in permanent darkness, while in the symmetrically-placed Antarctic Circle, $b\ b'$, there is perpetual day. The sun is vertical to $d\ d'$, the Tropic of Capricorn, $23\frac{1}{2}^{\circ}$ south of the equator. In the northern hemisphere, then, the rays are as oblique as possible, the least amount of heat is received, the nights are longest, and it is winter. It might be thought that since the sun reaches its most northern limit on June 21st, the longest day, that that day would also be the hottest; but this is not so. For some time after this day the earth (in the northern hemisphere) is receiving more heat during the day than it loses during the night; there is, therefore, a gain of heat during each twenty-four hours, although the gain itself gets gradually less. Hence it is hotter in the months of July and August than in June. It is to be remembered also that the earth moves, not in a circle, but in an ellipse with the sun in one focus; at one part of the year, therefore, the earth is nearer the sun (in perihelion) and is moving fastest, while at another part it is in aphelion and is moving most slowly. The latter occurs during the northern summer, so that this is longer to the extent of about eight days than the northern winter. Being then farther away, from the sun, summer in the northern hemisphere is less extreme than in the southern. This tends to make both summer and winter more temperate in the northern than in the southern half of the globe.

Seathwaite, a valley between South-West Cumberland and North - West Lancashire, England. It is some three miles long, and is traversed by the Duddon. The scenery is picturesque, but the district enjoys the unenviable reputation of possessing the heaviest rainfall in the British Isles, if not in Europe. The average annual fall is 130 inches,

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but there is a record of 160 inches in one year. Near the village of Seathwaite, which is wholly situated in Lancashire, are the remains of a plumbago mine, once of such value that special regulations were adopted for its management. An unsuccessful attempt to resume operations was made in 1863. Seathwaite Tarn, a mountain lake, lies in the hills about six miles west of Coniston, and is commanded by Seathwaite Fells, of which the highest point, Greyfriars, is 2,537 feet above sea-level.

Seattle, capital of King County, Washington State, United States, on the eastern shore of Puget Sound, an arm of the Pacific, 25 miles N.N.E. of Tacoma. It has a magnificent situation, commanding gorgeous views of Mount Rainier (14,530 feet) and other summits of the Cascade Range to the north, east and west and of Mount Olympus (8,136 feet) and Mount Constance (7,795 feet) on the opposite coast of Puget Sound. Its harbour provides anchorage for the largest vessels, and there is regular communication by steamer with Honolulu, Japan, China and the Philippines, while it is a point of departure for the Yukon, Klondike, and North-West Canada. The industries comprise shipbuilding, iron-founding, brewing, engineering works, meat-packing, smelting and refining, and lumbering, besides manufactures of machinery, flour, bricks and tiles, boots and shoes, carriages and furniture. It is the seat of Washington University. The commercial quarters were nearly entirely consumed by fire in 1889. Pop. (1900), 80,671.



GENERAL VIEW OF THE TEST OF A SEA-URCHIN.

A, most of the spines removed; B, portion of zones enlarged; head of sucker with valves open (C) and with valves closed (D).

Sea-Urchin (*Echinus*, Latin, "hedgehog"), the common name for the members of the class Echinoidea. They are also popularly known as Sea-eggs and Sea Hedgehogs, the latter being the English of the French *oursin*, which is attempted to be Englished straight off in the word "urchin." The body of the creature is more or less globular and symmetrical and covered with spines, jointed on to knobs or tubercles borne by the closely-fitting limestone plates of the shell. The tubercles do not cover the surface of the test or shell promiscu-

ously, but are disposed in five broad zones extending from pole to pole of the globe and alternating with five narrower zones bearing smaller and fewer tubercles and pierced with small holes arranged in regular rows. Through these holes the Urchin protrudes its tentacles or tube-feet, which are provided with terminal suckers, like those of the starfish, and are largely used in locomotion, especially when the animal climbs a steep slope. On more level ground the spines, too, are employed for this purpose, progress being made by a kind of tilting action. The Urchins are gregarious, and those inhabiting coasts exposed to the devastation of waves protect themselves by hollowing out cavities in the solid rock, no matter how hard this may be. They chisel out the rock with their teeth by constantly turning round and round, beginning when young and continually enlarging their habitation to allow for the growth of their test and spines. They feed on seaweed, organisms of various sorts and organic matter in deposits. The "dead" test figures in many households as an interesting ornament of the mantelshelf.

Seaweeds. [ALGÆ.]

Sebaceous Gland. Sebaceous glands are met with in most parts of the skin, being very numerous in situations where there is abundant growth of hair, but entirely absent from the palms of the hand and soles of the feet. They secrete a soft ointment-like substance and usually discharge into a hair follicle, the secretion serving to lubricate the hair. Cysts sometimes develop in association with the blocking of the orifice of a sebaceous gland. These sebaceous cysts are frequently met with in the scalp.

Sebastian, St. was born at Narbonne, in France, in the 3rd century after Christ. His parents were Christians, and, after being educated at Milan, and being made a captain of the prætorian guard, he became a zealous missionary, which led to his condemnation by Diocletian, Emperor of Rome, who ordered him to be shot with arrows. He miraculously recovered, and interceded with the tyrant for the Christians, and was then martyred, and his body thrown into a sewer, whence it was obtained and buried in the catacombs of Rome. His festival is January 20th. He is the patron-saint of archers, because he was bound to a tree and shot at with arrows; of pin-makers, for the quaint reason that the arrows stuck in his poor body as thickly as pins in a cushion; of soldiers, for that he was a centurion; and against plague and pestilence, his cult obtaining especially in the pest-ridden districts of Italy. St. Edmund (841-870), the last king of the East Angles, has been called the English St. Sebastian, in reference to the manner of his death. After the defeat of his people by the Danes at Thetford, he delivered himself up to them, hoping thereby to save them. But refusing to abandon his faith and deny Jesus,

he was bound to a tree at Hoxne, in East Suffolk, and riddled with arrows. The great abbey at Bury St. Edmunds was erected in his honour and his remains were long kept in a shrine



"SEBASTIAN CROWNED BY ANGELS."

(Matteo di Giovanni da Siena.)

there. The martyrdom of St. Sebastian has been a favourite subject with painters, and in *Alton Locke* Charles Kingsley makes particular allusion to the fine picture, formerly ascribed to Guido Reni, in Dulwich Gallery.

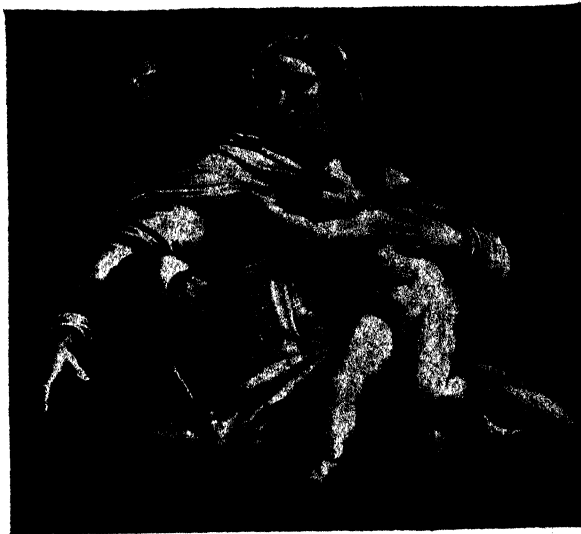
Sebastiani, François Horace Bastien, COUNT, soldier and statesman, was born at La Porta, in Corsica, on November 15th, 1772, claimed connection with the first Napoleon, with whom he soon became intimate. Joining the army, he distinguished himself greatly in Bonaparte's Italian wars, and was at Arcola, Verona, and Marengo, as well as at Austerlitz, where he was wounded, and served throughout the Russian catastrophe and the fighting in Saxony. After Waterloo he spent a few months in England, but having accepted the new régime, returned to France, and in 1819 was elected Deputy for Corsica. He held several ministerial appointments, including the Navy and Foreign Affairs. While badgered by the Left, during a debate on the affairs of Poland, he let drop a phrase the infamous significance of which rendered it immediately famous. "L'ordre," he said (September 16th, 1831), "règne à Varsovie"—("Peace reigns at War-

saw," the kind of peace that prevails after a country has been desolated and its people slain. It was a saying worthy of being bracketed with Tacitus's *Solitudinem faciunt pacem appellant*, which Lord Byron adopted in *The Bride of Abydos*, "He makes a solitude and calls it—peace"). Sebastiani was ambassador at Naples in 1834, and from 1835 to 1840 at the Court of St. James's, where he was succeeded by Guizot. He died in Paris on July 20th, 1851.

Sebastiano del Piombo, whose family name was Luciani, painter, was born in 1485 at Venice, whence he has been sometimes called **VENEZIANO**. He first studied music, but afterwards turned to painting, studying under Giovanni Bellini and Giorgione. His first considerable painting was executed for a Venetian church, and so closely adopted the method and style of Giorgione that it was often taken for the latter's work. Luciani went to Rome in 1512, on the invitation of Agostino Chigi, a distinguished patron, for whom he did some frescoes. He formed a friendship with Michael Angelo, which is said to have ripened into a partnership to this extent, that he coloured the designs made by Michael Angelo, who was supposed to be a perfect master of *technique*, but weak in colour. However this may be (for means are lacking to test the truth of the allegation), the pictures painted in pursuance of this bargain are stated to have been the "Pietà," at Viterbo; the "Transfiguration" and "Flagellation" in the church of San Pietro in Montorio, Rome, and the magnificent "Raising of Lazarus," one of the notable canvases in the National Gallery in London. The last-named was painted in 1517-19 for Giulio de' Medici (afterwards Pope Clement VII.), who placed it in Narbonne Cathedral, where it was bought early in the 18th century by the Duke of Orleans, at last reaching England in 1792 with the Orleans collection. Soon after the accession of Clement VII. Sebastiano was made keeper *del piombo*, or the leaden seal appended to Papal charters and documents, and thus acquired the name by which he is best known. He painted several famous portraits, amongst them that of Andrea Doria, but was a lazy fellow and did no more work even in art than he could help. He died in Rome on June 21st, 1547.

Sebastopol, or SEVASTOPOL, the chief naval port and arsenal of Russia, in the government of Taurida, on the Black Sea, stands, at the south-western extremity of the Crimea, on the southern shore of the estuary of the Tcher-

naya, which, with a length of nearly 4 miles and a breadth of over half a mile, affords secure anchorage for the largest vessels. In 1854 the siege by the combined forces of Great Britain and France, which lasted nearly a year and a half, reduced the city to a heap of ruins. By the Treaty of Paris terminating the Crimean War Russia was forbidden to restore the fortifications or to maintain a Black Sea fleet. These obligations, however, were repudiated in 1870, and now Sebastopol has recovered its former prosperity and military importance. The principal buildings are the cathedral of St. Peter and St. Paul, modelled after the



MADONNA AND CHILD.

(Painted by Sebastiano del Piombo.)

famous Temple of Theseus at Athens, and the Vladimir Cathedral. There are several monuments to the soldiers slain during the Crimean War. The town enjoys some repute as a mid-summer holiday and health resort. It has varied manufactures and shipbuilding is carried on. In classical times the district was known as Chersonesus, and in the 5th century B.C. a Greek colony was planted there and survived until it was absorbed in the kingdom of Bosphorus, becoming afterwards tributary to Rome. It subsequently passed into the possession of the Byzantine emperors, then into that of the Greeks again, and finally was overrun by Tatars, upon whose conquest in 1783 the site was chosen by Catherine II. for the Black Sea naval station and received its present name ("the august city"). Pop. (estimated), 55,000.

Sébillot, PAUL, painter and collector of folklore, was born in 1846 at Matignon, department

of Côtes-du-Nord, France. He began life as an art student in Paris, and exhibited at the Salons, between 1870 and 1883, several landscapes and sea-pieces. In the meantime he had become acquainted with the old legends and folklore of Brittany, and, the subject proving of growing attraction, he ultimately gave up painting and collected Breton stories and traditions, which he gathered, after the fashion of Sir Walter Scott, by ransacking the province even to its remotest nooks and crannies. These raids and researches resulted in several valuable books, amongst which may be named *Contes populaires de la Haute Bretagne* (1880-3), *Littérature orale de la Haute Bretagne* (1881), *Traditions et superstitions de la Haute Bretagne* (1882), *Gargantua dans les traditions populaires* (1883), *Contes de terre et de mer* (1883), *Contes des provinces de France* (1884), *Légendes Chrétiennes de la Haute Bretagne* (1885), and *Légendes, croyances et superstitions de la mer* (1886-7).

Secker, THOMAS, Archbishop of Canterbury, was born at Sibthorpe, Nottinghamshire, England, in 1693. He was educated at Tewkesbury with a view to the Dissenting ministry, but, being unable definitely to throw in his lot with Nonconformity, put aside theology for medicine, which he studied at London, Paris, and Leyden, where, in 1721, he took the degree of M.D. By the influence of Anglican friends, however, he was now induced to take holy orders and was ordained in 1723. Almost immediately he obtained the valuable living of Houghton-le-Spring in Durham. In 1732 he was appointed chaplain to George II. and became *persona grata* to Queen Caroline. In 1733 he was preferred to St. James's, Westminster, was nominated Bishop of Bristol next year, and, in 1737, was translated to the see of Oxford. Whilst at Oxford he grew very friendly with Sarah, Duchess of Marlborough, and acted as one of her executors. In 1750 he was installed Dean of St. Paul's, and in 1758 was elected Archbishop of Canterbury, holding the primacy till his death in Lambeth Palace on August 3rd, 1768. He was pre-eminently a "safe" prelate, stood well with the Dissenters, whom from early associations he understood, advocated granting the episcopacy to the American church, and agreed with the Jacobites whilst maintaining his own staunch Hanoverian principles. His charges are valuable for the light they cast on the condition of the Church during his time.

Second, one-sixtieth part of a minute and the unit of time which has been universally adopted. It is fundamentally derived from the time which elapses between two successive transits of a star, this being the time taken by the earth exactly to complete one revolution on its axis, the period being known as one sidereal day. The length of a pendulum which beats seconds varies in different places, owing to the variations of gravity. Hence, if the standard of length were lost, it could always be reconstructed. [PENDULUM.] A

second is also used as a measure of angles, it being one-sixtieth part of one angular minute, which is, again, one-sixtieth of a degree.

Secondary Batteries, ACCUMULATORS, or STORAGE CELLS. When an electric current is passed from one metallic plate to another through an electrolyte, the electrodes are polarised and, by suitably arranging matters, a considerable amount of energy may be stored up in this polarisation and subsequently be available as an electric current. In Planté's original secondary cell two large sheets of lead were immersed in dilute sulphuric acid; on connecting these to a source of electric current, the anode becomes covered with a film of lead peroxide, whilst hydrogen reduces any oxide which may be present on the cathode. If now the plates are disconnected from the charging dynamo or battery, they will be found to differ in potential by rather more than 2 volts, and, if connected, will give a current which is in the reverse direction to the charging current. In discharging, the peroxide plate is reduced and the lead plate is oxidised. Such a cell has a very small capacity, which may be largely increased by repeated charging and discharging, the polarity of the plates being reversed between each operation. This process of forming reduces the surface of the plates to a spongy condition, whereby their active area is much increased. In order to effect the same result more easily, Faure coated the plates with red lead, held in place by felt, which was packed between them, and which was converted by the forming process into lead peroxide on one plate and spongy lead on the other. An improvement on this plan was to cast the plates in the form of grids with many small holes, and to fill these with a paste of lead oxide and sulphuric acid. Many methods have also been devised for making spongy lead plates, the result to be aimed at in either case being a plate exposing a very large area of active material to the electrolyte. The chemical reactions which occur in secondary cells are of an exceedingly complicated character. Commercial accumulators usually consist of a number of plates alternatively positive and negative placed in glass boxes, suitable arrangements being made for connecting similar and insulating dissimilar plates. Such cells have important applications in electric lighting; in private installations the machinery may be run, say, one day in seven, as much energy being then stored as is needed during the week. In supplying electricity from central stations, the demand is practically confined to a few hours in the twenty-four, so that much less plant is needed if the machinery is run continuously, and the energy stored in accumulators for use when required; but, owing to the initial cost and maintenance of, and losses in, secondary batteries, it is as yet doubtful if any real economy is attained by this means. When in good order, the current efficiency of storage cells (that is, the ratio of ampere hours of

discharge to ampère hours of charge) is about 0.85; but, as the charging pressure must always be in excess of the discharging pressure, the watt efficiency is only about 0.75. Accumulators are also used for the propulsion of electric launches, and have been often tried for tramcars, but with doubtful success in the latter case, for a variety of reasons. They add to the weight of the vehicle, have to be replaced every few hours, and, owing to the constant vibration, deteriorate in parts rapidly. Some other forms of secondary cells, which are practically reversed primary cells—such as Daniell's.—have been proposed, but are of small practical importance.

Secondary Rocks. [MESOZOIC.]

Second Sight, the name given to the power of foreseeing events which was formerly believed to be no uncommon attainment in the Scottish Highlands. The most awful vision was the "wraith" or "fetch" (i.e., the shadowy image) of a person about to die. The reputed seers were commonly men of stern and upright character, who through their elevation above the things of sense were supposed to have acquired peculiar insight into the spiritual world. But second sight was not confined to events of a solemn nature; it frequently gave intelligence of the most ordinary occurrences of every-day life. A very full account of all its varieties, given in Martin Martin's *Description of the Western Isles of Scotland* (1703), is reproduced in a shorter form in Daniel Defoe's *Life and Adventures of Duncan Campbell* (1720). Numerous modern cases have been investigated by the Society for Psychical Research. A very remarkable instance came to light, almost in the contemporary period, in connection with the melancholy catastrophe of the foundering of the *Eurydice* during a snow-storm off Lucombe, on the south coast of the Isle of Wight, on March 24th, 1878. The vessel, when practically within sight of home, capsized and nearly every soul on board perished. That very day, at that very hour, Sir John McNeill, equerry of Queen Victoria, while on duty at Windsor Castle, suddenly rose to his feet, and, brushing his hands across his eyes, cried out, "My God! she's foundered," having beheld the calamity as in a vision. Sir John was a Highlander of credit and renown, and the circumstances of this experience of his second sight appeared to be unimpeachable.

Secretary Bird (*Serpentarius reptiliivorus*), a South African bird of prey, the sole species of its genus, by some ranked with the Falcons and by others made a distinct family. "No one, however," says Dr. Bowdler Sharpe, "who has seen a Secretary kill a rat and the prodigious force with which, by repeated blows of his powerful legs, sometimes springing into the air and bringing both feet down at the same moment upon his victim, he quickly reduces it to a shapeless pulp, would consider him anything but a bird of prey. Standing

before a cobra which rises to attack him, the Secretary spreads his wings out in front as a shield to guard his body, and then from behind this protection he strikes his enemy down. Sometimes," Dr. Sharpe adds, "the Secretary does not win in the fight with the snake, for a good observer has stated that on one occasion he saw a bird suddenly leave off fighting and run to a pool of water, where he fell down dead. If the snake bites a feather, the bird immediately pulls it out, but in the above instance the reptile had drawn blood from the point of the pinion. It is somewhat remarkable that the Secretary should have such strik-



SECRETARY BIRD.

ing power in his legs, as they are long and slender for the size of the bird, and are so brittle that it is said that, if suddenly started into a quick run, their legs will snap." Instinctively both the bird and the snake know that the ensuing battle will be a fight to a finish, but the Secretary is something of a general for it retreats before a vigorous onslaught until the reptile, a little exhausted with its own fury, exposes itself to a counter-attack and is soon overpowered, a dislocation of the vertebral column giving it the *coup de grace*. Then, as likely as not, the victor devours the prey, beginning with the tail, but smashing the skull. The bird is a voracious and, as has been seen, not too delicate a feeder. Rats, lizards, locusts, tortoises, and, if opportunity offer, fowls and the harmless necessary cat not coming at all amiss. Mrs. Annie Martin, however, says, in her vivid sketch of *Home Life on an Ostrich Farm*, that the birds "are sometimes taught to be very useful guardians of the poultry-yard, especially against aerial enemies—the long-legged, solemn-looking creature stalking about all day among his feeble-minded charges, with much consciousness of his own importance. He is accused of now and then taking toll in the shape

of an occasional egg or young chicken—the latter being, of course, bolted, anaconda fashion; but his depredations are not extensive, and one tolerates them," because, on the principle of setting a thief to catch a thief, he takes good care that his master is robbed by no one else. The total length is about 4 feet; the general hue of the plumage bluish-grey, with some black on the wings and tail. On the head is an erectile crest, which, from its fancied resemblance to pens stuck behind the ear, is said to have given the bird its popular name. The Secretary Bird, because of its relentless enmity to venomous serpents, is protected at the Cape, and for the same reason has been introduced into Guadeloupe and Martinique.

Secretary of State, an officer of State—in the United Kingdom, of Cabinet rank—entrusted with the control and superintendence of a particular department of Government. In the British ministry there are five secretaries whose duties are roughly indicated in the names of their departments. These officers are the Secretary of State for Foreign Affairs, charged with the transaction of all inter-State business with foreign countries, the negotiation of treaties, appointment of ambassadors, and other matters; the Secretary for India, who administers the affairs of that country, with the assistance of a council of experts not necessarily members of Parliament; the Secretary of State for the Home Department, who is concerned with the domestic affairs of the United Kingdom, such as the dispensation of justice, the maintenance of peace and order, the supervision of prisons, the active control (in the metropolis) of the police, the safeguarding of public health and sanitation, the licensing of vehicles and places of entertainment, the prerogative of mercy, and numerous other subjects; the Colonial Secretary, who is the responsible statesman for the protection of the colonies and the promotion of their welfare politically, and the Secretary for War, who is entrusted with the management of all affairs connected with the Army. John Mansel, or Maunsell (d. 1265), keeper of the Great Seal, appears to have been counsellor and secretary to Henry III., but probably his duties were more akin to those discharged now by a minister's parliamentary secretary. Henry VIII. introduced two State secretaries, and Queen Anne created a third (for Scotland) on the union of the kingdoms (1707), but this office was not retained. When there were only two secretaries, both managed home affairs, the one being responsible for those of the northern department, the other for those of the southern.

Secretion, the process of separation from the blood, by certain organs of the body, of materials which serve some further purpose in the performance of the functions of the animal economy, or are discharged from the body as being of no more use to it. The latter kind of material is sometimes spoken of as excretion,

as distinguished from a true secretion which has some further part to play in connection with the body in which it is elaborated.

Secret Societies are of extremely ancient date. The earliest written records of many races prove that such societies existed, the meetings, purposes and initiation ceremonies of which were unknown to all but the members. Among the Persians, the Hindus, the Egyptians, the Phœnicians, the Greeks, and the Romans, as well as the races that inhabited the Far East, secret societies were common, but they were for the most part very different from the modern secret society. They were usually of a religious character, and were founded often to bring their members in touch with the Being whom they regarded as God. Indeed, it may be allowed that in later days, with the spread of Monotheism, secret societies served a distinctly useful purpose in leading men away from idolatrous worship. For simplicity's sake the subject may be classified according to the ends which the societies sought to attain.

(1) **RELIGIOUS**. Most of the secret societies of the ancient world were of a religious character, such as the Magi of the Brahmins, dating from before 6000 B.C. The initiation ceremonies of this society were known only to those who had gone through them. Amongst other tortures the candidate was made to fast partially for 50 days, being meanwhile condemned to perpetual silence and solitary confinement in a subterranean cave. Thence he passed to a den of wild beasts, from which but few of the initiates ever came out unscathed; after this he was shown the horrors and torment of the wicked in Hades, and, finally, as a sign of regeneration, a live serpent was thrust into his breast. To be a member of the ancient Mithraic worship involved no less terrible ordeals and Buddhist religions had secret ceremonies also, the almost universal thought being that to be religious it was necessary to endure some torture. In Egypt, as in India, Persia, Mexico, and Peru, the usual place for the celebration of initiatory rites was a subterranean cave or the top of a pyramid. The mysteries of Egypt, such as those of Osiris, of Serapis, and of the Phœnix were always accompanied by secret initiations, as also was the Crata Repoa, which was regarded as the highest type of Egyptian mystery and had as many as seven degrees into which a candidate might ultimately be initiated. The early Greek and Roman mysteries were moral and religious secret societies, such as those of Orpheus and Dionysus. Many of them sprang from the religious observances attending the worship of Jupiter, Ceres and Proserpine at Rome. In many cases the Romans followed the doctrines of the Greeks and the secret mysteries and ceremonies of the Roman period are much the same as those of the more ancient civilisations. To leave Classic days, it would be hard to say which was the first secret society, but precedence must probably be given to the Druids of

Great Britain and Gaul. Their chief seat seems to have been in the Isle of Anglesey, and their mystic ceremonies in many ways recalled those of the Gymnosophists and Brahmins of India. At Stonehenge, Avebury and Shap, Cumberland, remains of their altars and temples are still found in ruined masses and enormous pillars of stone, and each year the Society of Modern Druids is said to perform a secret ceremony at Stonehenge, which is supposed to have been part of the ritual of the primitive Druids. Druidism was an elaborate religion and philosophy; the chief deities were a male and female, as in the case of the Egyptian Osiris and Isis, and the Roman Bacchus and Ceres. In China and Japan religious secret societies were very common from the earliest historical times, the Chinese for the most part being like those of the Magi of the Brahmins, while the Japanese resembled those of the Mithraists, for during the ceremony blood was poured on the earth to make it fertile. But of all ancient secret societies and ceremonies the most elaborate appear to have been those of the Mexicans and Peruvians. In them the candidate had to undergo the most horrible of tortures. At times of great mysteries and initiations the idols in their temples were washed with human blood and all kinds of ~~fast~~ rites took place, which were supposed by sympathetic magic to bring about the happiness of the novitiate. The Essenes, a sect of the Jews, the Chasidim of the Pharisees and the Zadikim of the Samaritans and Sadducees, were probably derived from Asiatic sources. In them the Eastern element is very strong, and it is for this reason that the Essenes and Therapeutae are often confounded. But they are distinct sects, the doctrines and rites of the Essenes rather resembling the ceremonies of Zoroastrianism, whilst those of the Therapeutae resembled those of the followers of Pythagoras. Both sects resided in Palestine, chiefly around the Dead Sea, from the 4th century of the Christian era, and were renowned for their moral and virtuous lives, no one being allowed into the community until he had served a probationary term of years, when, if he proved true to the secrets and objects of the society, he was allowed to enter into what was called the "grand secret" gradually. From the Essenes sprang the Jewish Cabbalists, whose secret doctrines were traditionally attributed by its members to Moses himself. There were two different kinds of Cabbala, the theoretical and the practical, but each professed the same doctrines. In the practical Cabbala there was a belief in spiritualistic phenomena, but the theoretical was dogmatic and literal, and perhaps was better known as the Mishna Society. The initiation ceremonies were usually of the most secret character. From time to time the Cabbalist doctrines have been revived. In 1609 they were revived at Prague, and in Poland in 1740, where the members called themselves the "New Saints," a sect which is said still to flourish. The mysteries of the Gnostics,

who had lodges in many of the Eastern countries, may be said to have been doctrinally a medley. They had a connexion with the philosophical creeds of Plato, Pythagoras and Heraclitus, mixed with the demonology and the spiritualistic teachings of the Cabbala. The growth of Gnosticism was doubtless due to the widespread attractions which the dogmas contained, but in their secrets they were more careful, its members recognising each other by the slightest touch when shaking hands. The Templars of the Middle Ages were a secret society in the proper sense of the term, for their rites and ceremonies were jealously guarded. Usually their initiations took place at night in the chapel of the Order, which only members were allowed to attend. The candidate for initiation had, among other things, like the Cathari and Manicheans of Italy, to deny, curse, and even spit at the Cross—not from disrespect, but to show their inability to understand why Christians should worship the Cross which had been the means of inflicting punishment on the Saviour. Again, in the same way they never recognised Peter as a saint because of his denial of Jesus. In the history of the Roman Catholic Church there is one secret society, the Inquisition, which, though it has comprised many great men, must yet be described, in view of its record, as the blackest organisation ever founded. Though not permanently established till 1248, persecution on more or less organised lines had been a recognised method of the early Catholic Church, and we read of Priscillian being executed at Trèves in 385 for the crime of heresy. So ghastly was the slaughter at the Colosseum that the Pope on one occasion, to remind a heretic of his doom if he did not repent, took up a handful of earth from the floor and squeezed blood from it. But in truth the Holy Office stands condemned at the bar of History by the chronicles of its judicial procedure, its diabolical torture chambers, and its cruel *auto-da-fés*.

(2) SOCIAL. The Alchemists and Rosicrucians may be said to be the first secret societies that were formed for purely social aims. The former, to whom chemistry is greatly indebted for valuable discoveries, led morbid, sad lives, always going in fear of being seized and put to death as heretics for their astronomical and other scientific observations, and it was, therefore, of necessity that they worked in secret. The Rosicrucians might be termed a sect of Theosophists. Before this sect was founded Alchemy had sunk to the lowest depths of disrepute and they became the spiritual alchemists of the time. The date of the founding of these societies is uncertain. By some authorities it is stated that they began in the 14th century, and by others in the 16th. In addition to their spiritualistic propaganda, the Rosicrucians took part in furthering the Reformation until they were put down by the European governments. A Catholic sect, the Blue Cross, was started in opposition to them, specially sanctioned and blessed by the Pope.

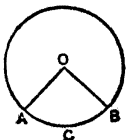
The Rosicrucians had lodges in most European countries, and the ritual and initiatory ceremony were of the most severely strict and secret kind. Yet in spite of this Roman Catholics obtained access and betrayed their secrets, thus bringing about repressive measures which practically ended in their downfall. From the Rosicrucians arose the Asiatic Brethren, but only Jews, Turks, Persians and Armenians were allowed to become members, and from these, combined with the teachings of the Templars, modern Freemasonry has arisen. Freemasonry has been established in almost every country. In the Neapolitan States there is the *Misrini*, which is found also in Dalmatia and the Ionian Islands. Among the negroes of the Gold Coast and the savages of the Pacific Islands secret societies exist, such as the notoriously immoral *Areociti* of Tahiti and the mutual benefit societies of the *Clobbersoll*. In India the Thugs of Mysore, the Carnatic and the Balaghat District and the *Polimus* of Chittoor in all probability are offsprings of the Assassins. The *Chaufeurs* of France during the religious wars of Henry III. and IV., the *Garduna* of Spain at the time of the Inquisition, the *Camorra* of Naples and its branches—of which at least one, the *Mala Vita*, still exists—were all semi-socialistic, semi-political secret societies.

(3) **POLITICAL.** The *Illuminati*, a united political secret society, sprang up about 1776 at Ingolstadt, Bavaria, and quickly spread over Europe into England. Although its objects and ceremonies had much in common with Freemasonry, it was not long before it was discovered to be political, its aims being similar to those of the French Revolutionaries. From that time it was doomed, but from it proceeded many organisations of kindred aims. About this time the *Carbonari* of Italy sprang up. It had no secrets, it had no dogmas, but its one great aim was liberty by constitutional government and truth. It is said to have been started by one called *Maghella*, and the first authenticated proof of its existence was in 1814. The organisation of the *Carbonari* was more simple than its forerunner, the *Illuminati*. The initiated were called the "Good Cousins," and those who did not join were termed "Pagans." In their efforts to gain constitutional government they incited the people not to pay taxes. From time to time constitutional rights were promised them, but at length, after a serious revolution in favour of the Bourbon Dynasty had been caused by them, attempts were made to suppress them. Many of their leaders were imprisoned and executed, but eventually Murat, after his own party had forsaken him after the battles of *Farrara* and *Tolentino*, veered round and promised the people constitutional government if they would help him. But it was too late: he had already played fast and loose with their wishes and the monarchy fell. After the accession of Ferdinand I. in 1815, that king wavered between letting the *Carbonari* have their way

and exterminating them. Finally, in 1820, having been cornered and pledged to keep his word, he shamelessly called in the Austrian army to crush the *Carbonarists*. The Austrians reached Naples after defeating the *Carbonarists* at *Rietz*, and Ferdinand, who in the meantime had taken care to be in his dominions south of the disturbed area, glutted his desire for vengeance on the leaders of the society. But the sect was not to be thus destroyed, and in 1825 it revived, ten years later becoming joined to Young Italy, whose views were identical with those of the *Carbonari*. By now, however, all Europe had become a hot-bed of secret societies with democratic, constitutional, and revolutionary aims. In France the *Philadelphians*, the *Rays*, and the *Secret League of Tirol* were opposed to Napoleon, while the *Illuminati* (not to be confounded with the *Illuminati* already mentioned), the *Black Needle*, and the *Knights of the Sun* were in his favour. In Germany the *Tugendbund* and its offspring, the *Burschenschaft* took an active part in frustrating his designs, and from them Young Germany arose. In Spain the *Comuneros*, a society seeking constitutional rights, was founded in 1816, afterwards becoming Young Spain. In 1812 the *Hetairia* of Greece, similar to the Italian *Carbonari*, was founded, and in Russia and Poland the *Omladina*, the *Modern Templars*, the *True Poles* and the *Decabrists* were formed. The aims of the *Camorra* and the *Mafia* of Sicily are alike, and their organised lawlessness is more feared than the laws themselves. Their main object is to do away with law entirely, and each member is bound never to resort to law in any circumstance but to punish an offender with his own hands, and it is for this reason that candidates always have to fight a duel at the initiation ceremony. The *Mafia* is probably one of the largest law-breaking sects in the world, and its criminal purposes are furthered by its members no matter in what part of the world they are living. But for the most patently criminal political secret societies we must look to China, for these often resolve themselves into mere confederations of robbers with no aim but pillage. Those whose main aims are political seem to practise the most revolting of crimes with perfect impunity. Of these the most prominent has ever been the *White Water Lily* sect, which has played an important part in Chinese history under many names, its first being that of the *Yellow Cap* of the Han Dynasty, A.D. 185. The *Tien-ti-Hwuy* is another great political society embracing many small ones and has members and lodges in every part of the globe. There are also the *Triad Society*, the *Blue Lotus Hall* and the famous *Hung League*, the *Ko-lao-Hui* and the *Taepings* of the 19th century and their modern representatives. Ireland since the Union has been a fertile breeding-ground of political discontent. The *White Boys*, dating from 1761, is said to be the oldest, but the most notorious

are the Fenians, founded by John O'Mahoney and Michael Doherty in 1848, the United Irishmen, the Hearts of Steel, Ribbonmen, Orangemen, as well as the Oak, Right, and Peep-o'-Day Boys.

(4) **NILILISTS AND ANARCHISTS.** The Assassins of Arabia and Syria were amongst the earliest, and their deeds were so daring as to be scarcely credible. With their founder and leader, Hassan Sabbah, at their head they terrified the kings of the earth, for their aims seem to have been partially political. At one time they are stated to have been 70,000 strong, and so faithful that when the Sultan of Egypt sent an officer to expostulate with Hassan Sabbah for some gross outrage, Hassan Sabbah called up two of his followers and ordered them to commit suicide, one by piercing himself to the heart, and the other by throwing himself from a tower. His commands were instantly obeyed and Hassan Sabbah, turning to the astonished emissary, said, "I have 70,000 followers, each of whom, if ordered, would do as these have done." Thus having poured contempt on the Sultan's protests he dismissed the messenger. Many great princes were in league with the Assassins for safety's sake, but after Hassan's death they fell away from their allegiance. Their territory was invaded by the Tatars and Egyptians, and they were almost exterminated, but some of them are still to be found on the banks of the Ganges and around Bombay, who call themselves Khodjas. The Nihilists of Russia did not have a corporate existence until 1870, but since that date they have left an indelible mark on the world's history. They have secret plans and aims, and death is the penalty for the unfaithful. They have members in almost every country. The Anarchists were first heard of in 1868 and during the Paris Commune in 1871. In 1872 their party split up, one half, less extreme than their fellows, calling themselves Social Democrats, the others retaining their old name. In 1879 the Anarchist John Most founded an Anarchist paper in London, called the *Freiheit*, but owing to its open approval of the Phoenix Park murders it was suppressed and Most emigrated to the United States. The Anarchists were accused of the outrages at Chicago in 1886, for which seven were put to death, and it is said that they were responsible for the assassinations of President Carnot at Lyons in 1894, of the Empress of Austria in 1898, of King Humbert of Italy in 1900, and of President McKinley in 1901.



Sector is the space included between two radii of a circle and the intercepted portion of the circumference. $O A C B$ represents such a sector and its area is equal to that of a triangle, whose base is a straight line equal to the curved line $A C B$, and whose height is equal to the radius $O A$.

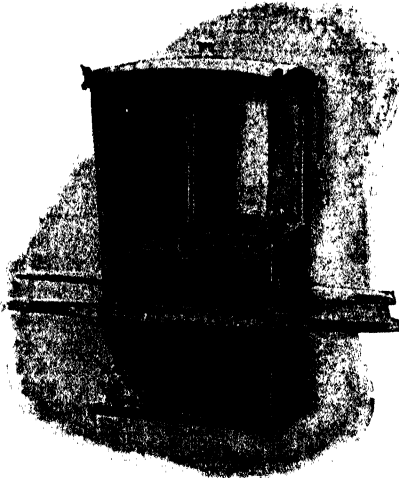
Secularism (Latin, *seculum*, "the present world"), a view of man's social duties propounded and named by George Jacob Holyoake (1817-1906) about 1846. Secularists maintain that the *summum bonum*—that which is most desirable for mankind at large—is sufficiently known from experience, and that, as vice results merely from error, it needs only an adequate training to make every citizen exert himself successfully for the benefit of his fellow-creatures. Theology and religion cramp and distort the mind by introducing considerations which have no real bearing on the relation of man to his surroundings in this present life, the only one of which we have any knowledge. The true ethical ideal, according to this school, is the wise employment of material agencies for the good of the community, and the existence or non-existence of a Divine Being is a matter of no importance at all.

Secunderabad (that is, "Alexander's town"), a British military cantonment in the Native State of Hyderabad, or the Nizam's Dominions, India, 6 miles N.E. of Hyderabad city, of which it may be considered a suburb. The cantonment, named after Nizam Sikandar Jah, is one of the most extensive military depôts in Hindostan, the area occupied by the barracks amounting to 20 square miles. European soldiers are accommodated in two-storeyed barracks, while the natives are housed in comfortably-built quarters. The surrounding country is undulating, with occasional outbursts of granite, and, save for the trees lining the roads in the cantonment and clusters here and there of date and palmyra palms, presents a somewhat bare and unattractive aspect. Cultivation is next to impossible on the more elevated portions for lack of soil, but in depressions and valleys agriculture is pursued. During the Mutiny of 1857 the fidelity of the troops at Secunderabad was assailed in vain, an attack on the Residency was defeated and, till the troubles were got under, yeoman service was afforded by both the Subsidiary Force and the Hyderabad Contingent.

Security, some bond or other act which makes the enjoyment or enforcement of a right more secure or certain. It is either personal, consisting of a promise or obligation by the debtor or another person, in addition to the original liability or obligation intended to be secured, or a security on property by virtue of which the enforcement of a liability or promise is facilitated and made more effectual.

Sedan, a town in the department of Ardennes, France, on the right bank of the Meuse, 13 miles E.S.E. of Mézières, and surrounded by hills. It was not definitely acquired by France until 1643, and then became a frontier fortress. But for two centuries before it had belonged to the La Marcks, a powerful family, who held their own, despite the antagonism of the Bishops of Liège and the Dukes of Burgundy and Lorraine, and even adopted the designa-

tion of Prince of Sedan. The last heiress brought Sedan and the duchy of Bouillon to Henri de la Tour d'Auvergne, Viscount of Turenne, but when he asserted his independence Henri IV. captured the place after three days' siege. The second duke (eldest brother of the illustrious Marshal Turenne, who was born in the town in 1611) having several times practically defied Louis XIII., was finally compelled to surrender his duchy. But Sedan was destined to acquire still more widespread notoriety, for here, on September 1, 1870, Napoleon III., with an army of over 80,000 men, was hemmed in by the Germans and forced to surrender. In the village of Bazeilles, to the south-east, where the marines made their heroic stand under General Martin des Pallières (1823-76), the house that figures so prominently in de Neuville's "Les Dernières Cartouches" has been converted into a museum of objects of interest associated with the grand *débâcle*. Cloth-making is a flourishing industry, which was founded by the Protestant refugees in the 16th century, who obtained the hospitality of the town, and there are several cotton-mills and iron-foundries. Pop. (1901), 19,349.

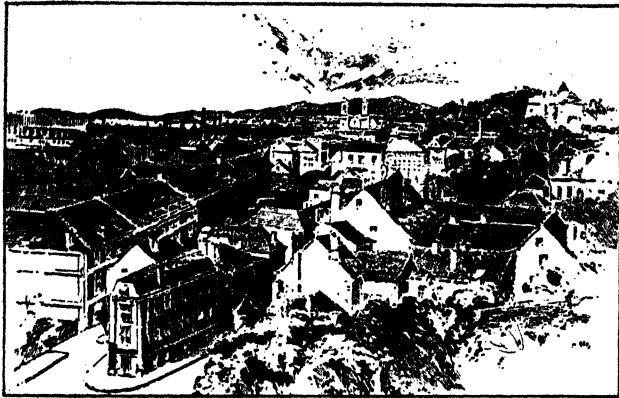


AN ENGLISH SEDAN CHAIR.

(Original in South Kensington Museum.)

Sedan Chair, a covered chair for carrying a single person, with a pole on each side. It is borne by two men, one in front of the chair and the other behind it. The vehicle is said to have been invented at Sedan in North-

Eastern France. It made its appearance in England in 1581, and was used by the Duke



Photo]

SEDAN,

[D. Stevenson, Sedan.

of Buckingham in the reign of James I. In 1634 Sir Sanders Duncombe obtained a patent for letting out these "covered chairs" in the cities of London and Westminster. Sedan chairs were much used by fashionable ladies and gentlemen in the 18th century. Those belonging to wealthy persons of taste were often beautifully ornamented and decorated with panel paintings of exquisite finish. In Edinburgh, where they were in constant use for routs and assemblies and the theatre, the public chairs were mostly carried by Highlanders, who acquired a bad reputation for their extortionate charges and their fiery tempers, which not infrequently provoked minor riots when a considerable number of chairmen happened to congregate in any one place. Examples of the Sedan chair may still be seen in most of the larger museums.

Sedative, the term applied to a class of remedies which exercise a restraining action on certain of the animal tissues. For example, respiratory sedatives prevent spasm of the muscular tissue of the bronchi, and so relieve cough. Cerebral sedatives, such as the bromides, diminish excitability and over-activity of the central nervous system. Cardiac sedatives comprise the drugs which exercise a restraining influence on the nervo-muscular apparatus of the heart, and intestinal sedatives tend to arrest the muscular movements of the bowel.

Sedburgh, a town of the West Riding of Yorkshire, England, 10 miles E. of Kendal. It lies in a valley, surrounded by fells and moors, on the borders of Westmoreland, on the old coach road between Lancaster and Newcastle. The principal buildings include the Late Norman church of St. Andrew (restored in 1886), the public hall, and the market-house. The Royal Grammar School is an institution of decided

repute. It was established in the reign of Henry VII. by Roger Lupton, Provost of Eton, refounded in 1552 by Edward VI., and reorganised in 1874 in accordance with a scheme of the Endowed Schools Commission. The town is an agricultural centre of some consequence and some weaving is carried on. Pop. (1901), 2,430.

Sedge, a name applied to most members of the order Cyperaceæ, and especially to the genus *Carex*. The order includes about 120 genera and 2,000 species, most abundantly represented in temperate and cold regions. It belongs to the series Glumifera, of the sub-class Nudifloræ, among Monocotyledons, and consists of grass-like herbaceous plants, which have generally solid, jointed stems, often three-sided; leaves, tristichous and furnished with a tubular sheath (not split, as in grasses); and spikelets of reduced, and often unisexual, flowers, each in the axil of a glume. The perianth is only represented by a whorl of hairs or by adherent glumes forming the so-called utricle in some pistillate flowers. The stamens, though varying from one to twelve, are usually three, and have basifixed anthers. The ovary is syncarpous, of two or, more commonly, three carpels, with a style divided above, and one ovule. The embryo is at the base of the seed, but is surrounded by albumen. Several species, such as *Carex arenaria*, are valuable, as binding shifting sand with their creeping rhizomes; others, such as the bulrush (*Scirpus lacustris*) are used for chair-bottoms, mats, etc.; the long perianth-hairs of the so-called "cotton-grass" (*Eriophorum*) are used, under the name of "Arctic wool," to stuff cushions; and *Papyrus antiquorum*, formerly abundant in the Nile, yielded the papyrus or paper of the ancients. The foliage is, as a rule, too harsh for fodder, and the albumen of the seeds does not improve or increase noticeably under cultivation.

Sedgemoor, a marshy district in the middle of Somersetshire, England, 5 miles S.E. of Bridgwater. It derives its name from the abundant growth of the common sedge, from the decay of which have been formed beds of peat that have been worked at intervals since the Roman times. The area is bounded on the north-east by low hills and on the south-west by the Parret. It was formerly of greater extent, but has been largely reclaimed. Virgin tracts, however, are yet covered with heather and bog myrtle and traversed by reedy ditches. It is utilised for grazing. The region is noted as the site of the battle of July 6th, 1685, in which the Duke of Monmouth's raw recruits, notwithstanding their undoubted pluck, were no match for the trained Royal forces under Lord Feverham. It was, says Lord Macaulay, "the last fight, deserving the name of battle, that has been fought on English ground." The historian describes the field as "a flat expanse, now rich with cornfields and apple trees, but then, as the name imports, for the most part a dreary morass. When the rains were heavy,

and the Parret and its tributary streams rose above their banks, this tract was often flooded. It was, indeed, anciently a part of that great swamp which is renowned in our early chronicles as having arrested the progress of two successive races of invaders, which long protected the Celts against the aggressions of the kings of Wessex, and which sheltered Alfred from the pursuit of the Danes. In those remote times this region could be traversed only in boats. It was a vast pool, wherein were scattered many islets of shifting and treacherous soil, overhung with rank jungle and swarming with deer and wild swine. Even in the days of the Tudors, the traveller whose journey lay from Ilchester to Bridgwater was forced to make a circuit of several miles in order to avoid the waters. When Monmouth looked upon Sedgemoor, it had been partially reclaimed by art, and was intersected by many deep and wide trenches which, in that country, are called rhines. In the midst of the moor rose, clustering round the towers of churches, a few villages, of which the names seem to indicate that they once were surrounded by waves." Macaulay refers to such names as Zoyland, Middlezoy, and Chedzoy.

Sedgley, a town of Staffordshire, England, 3 miles S. of Wolverhampton. Its prosperity is due to the rapid development of its manufactures, which are those of the Black Country, in which it is situated, and include nails, rivets, chains, locks, and safes. The district is rich in coal, lime, and ironstone. The principal public buildings are wholly modern. Pop. (1901), 15,951; of parish, 38,170.

Sedgwick, ADAM, geologist, was born at Dent, in Yorkshire, on March 22nd, 1785, and was educated at Dent, Sedbergh and Trinity College, Cambridge. He was ordained in 1816, and in 1818, though knowing nothing of the subject, he had the wit to stand for the Woodwardian chair of geology and to beat his opponent. He now set seriously to work to master his subject and succeeded in becoming one of the leading exponents and popularisers of the science. He was elected fellow of the Geological Society in 1818 and of the Royal in 1830; became President of the former in 1831 and of the British Association in 1833. Always interested in his university, he helped to establish the Cambridge Philosophical Society, and in 1847 became Cambridge secretary to Prince Albert when the latter was elected Chancellor of the University. Nor did he miss clerical preferment, for, though he declined the deanery of Peterborough, he accepted a canonry at Norwich in 1834. He died in Cambridge on January 27th, 1873. It is curious that his name does not stand to a single complete work on geology, but he contributed papers to the learned societies on the rocks of Cornwall and Devon, the New Red Sandstone, the Lake District, trap dykes and rocks, "On the Structure of Large Mineral Masses," and the geology of Wales. Sedgwick and Sir Roderick Impey

Murchison investigated the Principality concurrently, each working in different areas, and a divergence of view, in which Sedgwick was right, precipitated a permanent breach between the old friends. The Woodwardian Museum in Cambridge owed everything to Sedgwick.

Sedimentary Rocks are rocks formed by the deposition of materials previously held in suspension by water, and an aqueous origin may always be sought for these layers. Clays and slates are examples of such rocks. Their composition is frequently visible to the naked eye, both in mass (as they lie *in situ* in strata) and in the piece. Often it consists of the water-worn detritus of other kinds of rock, such as volcanic, which has been eroded and borne away by currents and deposited at some place, possibly remote from its parent rock. It is, of course, evident that sedimentary strata must be made up of fragments of the crust of the earth, or of materials recently erupted, or of older sediments which have been disturbed, disintegrated and are once more in the process of being deposited afresh. The particular interest and value of the sedimentary rocks rest in the fact that they are the only beds in which organic remains are or can be found.

Sedley, SIR CHARLES, poet and wit, was the son of Sir John Sedley, and was born at Aylesford, in Kent, in or about 1639. After leaving Wadham College, Oxford, he travelled abroad, returning after the Restoration, and becoming a bosom friend of Charles II., whom he even excelled in recklessness. On one occasion he was fined £500 for a wild orgie in Covent Garden. In 1661 he became M.P. for New Romney, and was married in 1657, at St. Giles's-in-the-Fields, to Catherine, daughter of John Savage, Earl of Rivers, by whom he had one daughter, Catherine. She afterwards, in spite of her homely looks, became the favourite mistress of James II.—“it cannot be my beauty,” said the lady, trying to account for the Duke of York's passion, “for he must see I have none; and it cannot be my wit, for he has not enough to know that I have any,”—who created her Countess of Dorchester. Sedley's parliamentary speeches bore largely on the necessity for retrenchment, though after the death of Charles II. he withdrew from London as much as he could. He died on August 20th, 1701. His reputation in letters must be pronounced, on the whole, in excess of his deserts. He wrote a few charming lyrics, such as “Phyllis is my only joy” and “Love still has Something of the Sea.” Of his two tragedies—*Antony and Cleopatra* (1677) and *The Tyrant King of Crete*—the second was never acted, and the first could not hold the stage. Of his three comedies the best, *Belshazzar*, or *The Mistress* (1687), founded on Terence's *Eunuchus*, is also the grossest. His poems were collected in 1701 and again in 1707, and there have been later editions.

Seed, the fertilised ovule or macrosporocarp of Spermatophyta (Phanerogamia), of which it con-

stitutes the most distinctive structure. It is a peculiar modification of a structure occurring in lower plants (Pteridophyta), which encloses a macrospore (embryo-sac) with its embryo and albumen, and becomes, when ripe, detached from the sporophyte. Its seed-coats or integuments being an outgrowth from the parent sporophyte, the embryo-sac being an oöphyte, and the embryo an immature sporophyte, the seed contains structures belonging to three generations. When the structural and other changes that immediately follow fertilisation are complete, and the seed becomes “ripe,” it enters upon what is generally the most marked period of unchanging repose in the life-history of the plant, a period which may be of the most varied duration before germination begins. The typical seed consists of integument, embryo, and albumen. The integument may consist of one coat or testa, or there may be an inner one, the tegmen. The testa may be smooth, as in the bean or the horse-chestnut, where it is marked by a large scar or hilum at its point of attachment, or it may bear wrinkles or tubercles, wings or hairs. The seeds of firs and toadflax, e.g., are winged; cotton is the hairs on the testa of *Gossypium*; and willows have a similar tuft of hairs or coma. Such wings and tufts occur only on the seeds of dehiscent fruits, serving, as do the similar structures on the fruits themselves, to disperse the seed beyond the shadow of the parent. The testa is usually thick, leathery, opaque, impermeable, bitter and indigestible, and is more often brown than any other colour. It serves to protect the contained embryo from premature germination by excluding damp, or from the action of sea-water, or the gastric juice of the animal stomach. The testa of linseed is mucilaginous, that of the gooseberry and pomegranate is pulpy, and that of the Brazil-nut notoriously is exceptionally woody, whilst orchids have a testa reduced to one layer of transparent cells. Brightly-coloured testas are confined to dehiscent fruits, as are also the fleshy outgrowths from the testa known as arils. When present, the tegmen, or endopleura, is usually a delicate, cream-coloured coat, as in the almond, hazel, or walnut. In a few seeds, no albumen is formed; but in the majority of exalbuminous seeds, though formed, it is absorbed by the embryo before the seed ripens.

Seeley, SIR JOHN ROBERT, historian, was born in London on September 10th, 1834, and educated at Stanmore, the City of London School, and Christ's College, Cambridge, where, in 1857, he was the best scholar of his year. In 1859 he dropped into poetry, producing a volume of verse entitled *David and Samuel*. For the following four years he was chief assistant in Classics at his old school, and in 1863 he was appointed Professor of Latin in University College, London. In 1865 he published anonymously his book, *Ecce Homo*, which, dealing with the person of Jesus on His human side

only, provoked much controversy. In 1869 he succeeded Charles Kingsley in the chair of Modern History at Cambridge. Next year appeared his *Lectures and Essays*, and in 1871 *The First Book of Livy*, an edition which he did not



SIR JOHN R. SEELEY.

(Photo : Elliott & Fry, Baker St., W.)

care to complete, the task apparently being antipathetic. *The Life and Times of Stein* (1878) is one of his most valuable contributions to historical knowledge, and was followed in 1882 by *Natural Religion*, which, lacking the element of human interest, fell comparatively flat. *The Expansion of England*, published in 1883, proved to be his most popular book, and *The Growth of British Policy*

(1895) was one of his most valuable works. At the recommendation of Lord Rosebery he was created K.C.M.G. in 1894, but did not enjoy his honour long, dying at Cambridge on January 13th, 1895.

Segovia, a province of Spain, formerly part of Old Castile, bounded on the N. by Burgos, on the N.E. by Soria, on the S.E. by Guadalajara and Madrid, on the S.W. by Avila, and on the N.W. by Valladolid. It occupies an area of 2,635 square miles. It is mostly a lofty tableland, of somewhat monotonous appearance and arid in summer, yet producing fine crops of wheat. On the south-east the Guadarrama range cuts off Old from New Castile. By the Puerto or Pass of Somosierra Napoleon swooped down on Madrid in 1808. The rivers Eresma, Cega, Duraton and Rianza, aided by systematic irrigation, water the province well. The leading industry is agriculture, wheat, rye, oats, barley, maize, peas, hemp, flax and vines being the principal crops, while live-stock are raised, including mules and asses. The manufactures comprise porcelain, paper, leather, flour, oil, and chalk, in addition to brewing and distilling. Segovia is the capital. Pop. (1900), 159,243.

Segovia, capital of the preceding province, Spain, near the point where the Clamores joins the Eresma, about 45 miles N.W. of Madrid. In ancient times a Roman pleasure resort, in the Middle Ages it was a centre of religious influence and must rank as one of the deeply interesting places in the kingdom. The Alcazar, or fortress, stands on a rocky precipice.

Only the original façade remains, the structure having been fired in 1862 by a gang of students and nearly destroyed. Local enterprise led to its being restored. Isabella of Castile was crowned within its walls. The 16th-century cathedral is an admirable example of Late Gothic. Other churches present picturesque features, but are lapsing into decay. The glory of Segovia is the colossal aqueduct known as El Puente del Diablo. It was built in the reign of the Emperor Trajan, and is still in good order. The bridge across the valley is 847 yards long and consists of a double tier of arches, the three centre arches being 102 feet high. Trade languishes, but paper, flour, and earthenware are made, besides dyeing and iron-founding. Pop., 14,692.

Ségur, LOUIS PHILIPPE, COUNT DE, diplomatist and author, was born in Paris on December 10th, 1753. Though he was a soldier, his love of liberty led him to cross the Atlantic to assist the Americans in their War of Independence. From 1784 to 1791 he was Minister Plenipotentiary in Russia, and went to Berlin as Ambassador in the latter year. He was received so coldly that he fought a duel and left. He retired into private life for a few years, but returned to political animation on his election as Deputy for Isère in 1801. He was ennobled by Napoleon before his downfall and permitted to take his seat as a peer in 1819. He cordially supported the Revolution of 1830, and died in Paris in the same year on the 27th of August. From his youth upwards he had consorted with the men and women of light and leading of his time, and was himself author of several admired books, amongst them being *Pensées politiques* (1795), *Politique de tous les Cabinets de l'Europe pendant les règnes de Louis XV. et de Louis XVI.* (1801), *Histoire de France* (1824), and *Mémoires ou Souvenirs et Anecdotes* (1824). He was the son of a notable Marshal of France, PHILIPPE HENRI, MARQUIS DE SÉGUR, who was born on January 20th, 1724, and died in Paris on October 3rd, 1801. He lost an arm at Laufeld in 1747 and was wounded and taken prisoner at Klosterkamp in 1760. He was appointed War Minister in 1780, and three years later became Marshal of France. He had left the Ministry before the Revolution, but was imprisoned for a few months in 1792.

Seidlitz Powder. The spring of Seidlitz, in Bohemia, furnishes a natural aperient water, the chief constituent of which is the double tartrate of soda and potash. The *pulvis soda tartarata effervescens* of the Pharmacopœia consists of this drug, together with some bicarbonate of sodium contained in a blue paper, and some tartaric acid contained in a white paper. The two powders are mixed in about half a pint of water, carbonic acid is liberated, and the draught is taken during effervescence. It is a harmless and favourite remedy for headache, biliousness and constipation.

Seine, a river of France, rising in the plateau of Langres, department of Côte d'Or, 18 miles N.W. of Dijon, at a point 1,545 feet above the level of the sea, the source being indicated by the statue of a nymph erected by the city of Paris. Although in a direct line the distance from the springs to its mouth in the English Channel is only 250 miles, in consequence of the serpentine course it pursues, especially between Paris and the estuary, the distance is increased to no fewer than 482 miles. From the source to Romilly its direction is mainly north-westerly, but there it bends to the west as far as Montereau, where it resumes its general trend towards the north-west. Its principal tributaries are, on the right, the Ource, Aube, Marne, Oise and Epte, and, on the left, the Yonne, Loing, Essonne and Eure. The chief places on its banks are Chatillon, Bar, Troyes, Romilly, Montereau, Melun, Essonnes, Corbeil, Paris and certain of its environs, St. Germain, Mantes, Vernon, Elbeuf, Rouen, and, at the mouth, Havre, on the right, and Honfleur, on the left. It is navigable for vessels of deep draught to Rouen, to Paris for passenger steamers (with a frequent daily service on both banks from end to end of the capital), and ships of 10 feet draught, and for smaller boats and barges as far up as Bar. The Seine valley is almost everywhere extremely fertile and the scenery of the lower reaches is very picturesque, occasionally opening up vistas of remarkable beauty, as at St. Germain. It is noteworthy among streams for the regularity of its flow, a feature which is due to the permeable strata absorbing the precipitation of the atmosphere and restoring it to the river by the means of springs.

Seine, the smallest, but most populous, department of France. It is surrounded by the department of Seine-et-Oise, from which it is divided in certain parts by the Seine, the Marne and the Bièvre, and has an area of 185 square miles, of which the capital occupies at least one-sixth. There are some wooded heights on the left bank of the Seine and the surface generally is pleasantly diversified. The Bois de Boulogne and Bois de Vincennes belong to the area of Paris. The principal crops are wheat, potatoes, oats, rye and vines, and some live-stock are raised. Gardening has been carried to a remarkable pitch of perfection in every branch (vegetables, flowers and fruit). There is abundance of building stone within the department, but no coal or other mineral. The industries include, in addition to those characteristic of Paris, chemicals, textiles and many others at St. Denis, tobacco and glass at Pantin, chemicals at Aubervilliers, woollens, dyeing and engineering at Puteaux, laundries at Boulogne, crystal at Clichy, iron and engineering at Ivry, porcelain, chemicals and oilcloth at Choisy-le-Roi, leather and porcelain at Montreuil. The department constituted part of the old province of Île de France. Paris is the capital. Pop. (1901), 3,669,930.

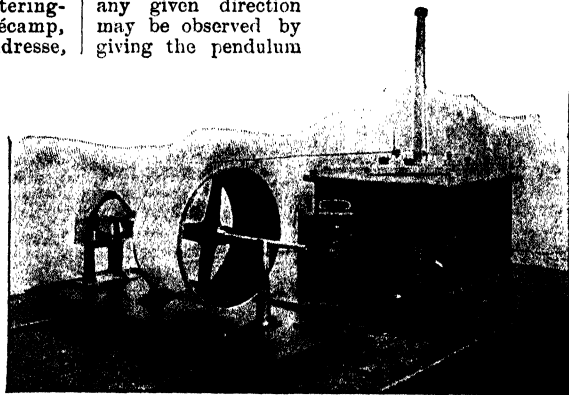
Seine-et-Marne, a department of France, bounded on the N. by Oise and Aisne, on the E. by Marne and Aube, on the S. by Yonne and Loiret, and on the W. by Seine-et-Oise, and having an area of 2,275 square miles, lying wholly within the basin of the Seine. The surface falls gently in a series of tablelands from east to west, the highest point, 705 feet, occurring in the north-east, and the soil is for the most part good, the pastures of the Brie producing famous cheeses, whilst the southern portion is noted for the white Chasselas grapes. The forests, including that of Fontainebleau, cover a fifth of the department, and yield valuable timber. The chief streams, in addition to the tidal-rivers, are the Yonne, Loing, Voulzie, Yeres, Ource, and the Grand and Petit Morin. The principal crops are wheat, oats, rye, barley, potatoes, beetroot, vines, and pulse, and there are considerable herds of cattle and horses, flocks of sheep and droves of pigs. Dairying is in a prosperous condition. Excepting quarries of building stone and the clay which is in great request for the potteries of the department, there are practically no mineral resources. Among the chief industries are paper-making, pottery, sugar-refining, tanning, iron-founding, and distilling, and the manufacture of bread-stuffs. Melun (13,059) is the capital, Fontainebleau (14,160), Meaux (13,690), and Provins (8,794) being towns of importance. The department was formed in 1790 out of the district of Brie and part of Gâtinais. Pop. (1901), 358,325.

Seine-et-Oise, a department of France, bounded on the E. by Seine-et-Marne, on the W. by Eure-et-Loir, on the S. by Loiret, on the N. by Oise, and on the N.W. by Eure. It encloses the department of Seine, and has an area of 2,184 square miles, most of which is arable land, though there are extensive woods about Versailles and St. Germain, many vineyards towards the south, and good pastures, including part of Brie. The chief streams are the Yeres, Marne, Oise, Epte, Essonne, Juine, Orge, Bièvre and Mauldre. The famous corn-growing plateau of La Beauce extends into the western portion. The principal crops are wheat, oats, rye, barley, potatoes, beetroot (for sugar and fodder), hay, oil-seeds, vines and green stuff. Live-stock are raised in considerable numbers and bee-keeping is a feature of rural economy. The leading forest trees are oaks, chestnuts, hornbeams and birches. Building stone, potter's clay, peat, sand, plaster and chalk occur. The factories for porcelain at Sèvres, powder at Sevran, paper at Essonnes, Corbeil, and Étampes, iron-founding at Corbeil and Argenteuil, employ many hands, and there are large cotton- and silk-mills, sugar-refineries, etc. Versailles (54,982) is the capital, and, besides the above-named, Pontoise, Mantes, Enghien, and Rambouillet are important centres. The department was constituted in 1790 out of portion of the ancient province of Île de France. Pop. (1901), 707,325.

Seine-Inférieure, a department of France, bounded on the N. and N.W. by the English Channel, on the N.E. by Somme, on the S. by Eure and the mouth of the Seine, and on the E. by Oise. The area of 2,448 square miles is mostly a plateau sloping from the east, where it is 800 feet above sea-level, to the river and sea, where the cliffs are broken by eroded valleys. The hills of Caux divide the department, the southern half being made up chiefly of pastures and forests, whilst arable farms prevail in the north. The surface is drained by tributaries of the Seine and by such coast streams as the Bresle, Yères, Arques, and Saane. The chalk cliffs of the shore have an average height of from 300 to 400 feet, and at the points where their white line is broken have been laid out the fashionable watering-places of Tréport, Dieppe, Étretat, Fécamp, St. Valéry, Veules, Yport and St. Adresse, some of which, like Tréport, are in perennial favour with the Parisians, while others, like Dieppe, enjoy a large English custom. The breeding of live-stock is vigorously pursued, the horses being in good repute. Butter and cheese are exported in enormous quantities, and dairying otherwise flourishes. The chief crops are wheat, oats, rye, barley, potatoes, pulse, beetroot, oil-seeds and fodder. Apples and pears are cultivated with especial care for cider and perry. The prevailing trees are oak, pine and beech, but there are great tracts of barren, sandy waste. Industries flourish, for Rouen is the Manchester and Elbeuf the Leeds of France, and there are engineering works at Havre and Rouen, tobacco factories at Dieppe, whilst sugar, flaxen yarn, lace, glass and other manufactures are produced at other places, and the fisheries are of permanent importance. Rouen (115,914) is the capital, and Havre (130,196) the busiest of the harbours on the Channel. There is daily communication by steamer between Dieppe and Newhaven in England. The department was formed in 1790 out of certain districts (Vexin, Bray, Caux and Roumois) of the old province of Normandy. Pop. (1901), 853,883.

Seismograph, or SEISMOMETER, an instrument for recording movements of the earth's surface, which, if sufficiently pronounced, become earthquakes. These motions are of two kinds—quick vibrations and slow tiltings of the surface. For measuring the quick tremors, a heavy body is suspended in such a way that it has freedom of motion in one or more directions, and is in a condition of nearly neutral equilibrium—that is to say, if it is displaced, it has hardly any tendency to return to its original position. A body so suspended would remain stationary, or nearly so, when its supports moved in consequence of earth-tremors, and the relative motions of the body and its

supports would be a measure of the extent of the motion of the ground. A very long pendulum fulfils the conditions as regards horizontal motions, but a more convenient arrangement, due to Professor Sir James Alfred Ewing, F.R.S., consists of two pendulums, one of which is inverted and placed vertically below the other. The two bobs are connected by a ball joint. The combination of the stability of the upper pendulum with the instability of the lower one can give the required neutral equilibrium. A point, connected with the lobes by multiplying levers, records the motion on a plate of smoked glass. By allowing the pendulums to swing freely in any direction, a complete record of the horizontal tremors is obtained, while the motions in any given direction may be observed by giving the pendulum



HORIZONTAL PENDULUM : PROF. JOHN MILNE'S NEW SEISMOGRAPH RECORDER.

(Photo: Pictorial Agency.)

freedom in that direction only. By the latter means the horizontal vibrations may be resolved into two components at right angles, and recorded on a disc of smoked glass rotated by clockwork; from the diagram so obtained the motion at any moment can be ascertained. An instrument for measuring vertical tremors may be constructed on the same principle. In Ewing's arrangement a horizontal lever, pivoted at one end and weighted at the other, is supported by a spiral spring, the position of the point of attachment being so arranged that the necessary neutral equilibrium is obtained. A style moved by multiplying levers is provided to make a record on smoked glass. These instruments would not be affected by a slow alteration of level of the earth's surface, for the measurement of which other appliances are needed. The simplest arrangement is to place two spirit levels on the spot to be observed, and to watch their bubbles with microscopes. A rough-and-ready seismometer consists in an earthenware bowl partly filled with a viscid fluid, like treacle. On being thrown against the side of the bowl by an earthquake the treacle leaves a visible record and

gives a crude notion of the direction of the horizontal element of the wave.

Selaginella. [CLUB-MOSSES.]

Selangor, one of the Federated Native States of the Malay Peninsula, under British protection. It is bounded on the N. by Perak, on the E. by Pahang and Negri Sembilan, on the S. by Negri Sembilan, and on the W. by the Strait of Malacca. It covers an area of 3,200 square miles, has a coast-line of 100 miles, and is about 48 miles broad. The state occupies the land between the central range and the sea. The chief streams are Selangor, Klang and Langat, but it is poorly watered. The principal mineral is tin, the mining of which is the leading industry, and the vegetable products comprise coffee, rice, gambier, pepper and rubber. In the latter half of the 18th century troubles arose between the Sultan and the Dutch, who blockaded his ports and ultimately extorted from him a treaty in which he acknowledged their sovereignty. Political communications with the British began in 1818, and were continued at intervals. Civil war broke out in 1867, which lasted till 1873, and this being followed next year by piracy off the Langat, a British Resident was appointed, at his own request, to assist the Sultan to administer his kingdom. Kuala Lumpur (32,381), on the Klang, is the capital and the largest town in the Malay Federation. Pop. (1901), 168,789.

Selborne, a parish of Hampshire, England, 4½ miles E.S.E. of Alton. It is situated in the western area of Woolmer Forest, which is frequently mentioned by the Rev. Gilbert White



SELBORNE CHURCH.

(Photo: A. Seeley, Richmond Hill.)

in his classic, *The Natural History of Selborne*. At the period of the Domesday survey the district formed part of the royal demesne. Peter de Rupibus, Bishop of Winchester, founded here in 1233 a priory of Black Canons, which was suppressed at a later date and constituted a portion of the endowment of Magdalen College, Oxford. St. Mary's Church shows various styles from Norman to Decorated, with modern additions, and has an

altar-piece of the Flemish school and a tablet to the memory of the great naturalist, who was a native of the village. Pop. of parish (1901), 1,430

Selborne, ROUNDELL PALMER, 1st EARL OF, Lord Chancellor, was born at Mixbury, Oxfordshire, England, on November 27th, 1812, and was educated at Rugby, Winchester, and Christ Church, Oxford, where he had a very brilliant career. He was called to the Equity bar in 1837 and soon acquired a lucrative practice, taking silk in 1849. Two years earlier he entered the House of Commons as member for Plymouth as a follower of Sir Robert Peel, and retained this seat, with a break of a few months, till 1857. In 1861 he was returned for Richmond, in Yorkshire, and became Solicitor-General (with the customary knighthood), being promoted to the Attorney-Generalship in 1863. He declined the Great Seal in 1868 rather than support the disendowment of the English Church in Ireland, but in 1872 succeeded Lord Hatherley as Lord Chancellor. He was then raised to the peerage as Baron Selborne. The great measure with which his name was associated was that of judicature reform, although the Bill as passed was not so drastic as he had sketched. He intended to have united the superior courts of law and equity and the London Court of Bankruptcy into one Supreme Court with original and appellate divisions and to have transferred to the latter division the appellate jurisdiction of the Privy Council and House of Lords in all except ecclesiastical causes save such as originated in Scotland, Ireland, the Colonies and Crown Dependencies. Shorn, however, of several of these features, the Bill passed in 1873. From 1874 to 1880 the Tories were in power and Lord Selborne was replaced by Lord Cairns, but in the latter year he was again Lord Chancellor, and, in 1882, on the opening of the Palace of Justice in the Strand, was created Viscount Wolmer and Earl of Selborne. He retained office till W. E. Gladstone's fall in 1885, and, being unable to accept Home Rule for Ireland, was debarred from entering the Liberal Ministry in 1886. He died at Blackmoor, Petersfield, on May 4th, 1895. He was popularly known as the editor of *The Book of Praise* (1863) in the "Golden Treasury" series. His son, WILLIAM WALDEGRAVE, 2ND EARL OF SELBORNE, was born on October 17th, 1859, and educated at Winchester and University College, Oxford. He was Under-Secretary for the Colonies from 1895 to 1900 and First Lord of the Admiralty from 1900 to 1905, in which year he succeeded Lord Milner as High Commissioner for South Africa.

Selborne Society, named in honour of the life-work accomplished at the village in Hampshire, where the great naturalist, Gilbert White (1720-93) was born and where he died. The Society was founded in 1885 and has for its objects the promotion of the study of natural history, the preservation of wild animals and

plants from needless destruction and the protection of places and objects of antiquarian interest or natural beauty.

Selby, a town of the West Riding of Yorkshire, England, on the right bank of the Ouse, which here separates the East and West Ridings, 15 miles S. of York. It is famous as the seat of the Benedictine Abbey of St. German, founded by William the Conqueror in 1070. In the course of time it acquired so much wealth, power, and privilege as to rival the chapter of St. Peter's Cathedral in York, its Superior being one of the only two mitred abbots north of the Trent. Henry I. was born within the precincts of the abbey, which to this event no doubt owed royal favour. Of the magnificent fabric the sole relic is the church of St. Mary and St. German, which suffered severely in the fire of October 20th, 1906, which gutted the building. It has a length of nearly 300 feet and a width of 60 feet. Of its many fine features the most noteworthy is the choir, erected between 1320 and 1350, which is a beautiful example of the Decorated style. The nave ranges from Late Norman to Early English. Traces may yet be made out of the cloisters which stood to the south of the nave, and part of the tithe-barn yet exists. Selby is the centre of a fertile country and its agricultural trade is important. The leading industries include flax-scutching, rope-making, the building of boats and barges, tanning, brewing and malting, and iron-founding, with the manufactures

of netting-twine and boot and shoe laces as a speciality. Pop. (1901), 7,786.

Selden, JOHN, English jurist and antiquary, was born at Salvington, in Sussex, England, on December 30th, 1584, and educated at Chichester and Hart Hall, Oxford. He was called to the bar in 1612, but even before this

had given evidence of industry, research and learning in his books, *Jani Facies* (1610), *England's Epinomis* (1610) and *The Duoello, or Single Combat* (1610), and others. In 1612 he annotated, at the author's request, the first eighteen cantos of Michael Drayton's *Polyolbion*, which



Photo]

SELBY ABBEY.

[G. Napry, Selby.

was followed by his *Titles of Honour* (1614) and his *History of Tythes*, which last he had to apologise for. In 1623 he became M.P. for Lancaster, espousing the popular side, and was returned for different boroughs in several subsequent Parliaments, his legal acumen and judicial mind being of the greatest service to the leaders of the Commons in their contest with Charles I. Ever since 1617, when he had published *De Diis Syris*, dealing with Syrian mythology, he had shown an intermittent interest in Oriental studies, on which he brought out several volumes, amongst them the *Marmora Arundelliana* (1624), in which he gave an account of the collection of the marbles and other antiques of Thomas Howard, 2nd Earl of Arundel. Selden's *Mare Clausum* (1635) upholds the right of the English to certain marine territory, but his argument has never been seriously accepted, and the work is not worthy of his high reputation. In 1640 he published *De Jure Naturali*. By this time he was justly celebrated as one of the greatest men of his age, and in 1643 he was appointed Keeper of the Records in the Tower. He was very popular, and in 1644 the Government voted him £5,000 for his public services. He died in London at Carmelite House on November 30th, 1654, and was buried in the Temple Church. His *Table Talk*, a deeply interesting work compiled by his secretary, Richard Milward, appeared thirty-five years after his death.

Selection, NATURAL. [DARWINISM.]



JOHN SELDEN.

(From the portrait by the elder Mytens.)

Selene, in Greek mythology, the goddess of the moon, the Latin Luna. She was the daughter of Hyperion and Theia, and therefore sister of Helios (the Sun) and Eos (the Dawn). Thus she also bears the name of Phoebe, as sister of Phoebus, the Sun-god. She was enamoured of Endymion and sent him to sleep in order to kiss him. She is represented as very beautiful, with long wings and a golden diadem. She rode across the sky in a chariot drawn by two white horses. In later times she was identified with Artemis, but though the worship of the two was combined, they were always treated independently in works of art, the figure of Selene being shown fuller and rounder, less tall, and clothed in a long robe, her veil forming an arch over her head, with a crescent above it.

Selenite, the translucent crystalline variety of gypsum, so named from the resemblance of its pearly lustre to moonlight. It crystallises in the Oblique system, often in flat rhomboid forms, and is in swallow-tailed twins. The crystals are sometimes large, very symmetrical, and laminated parallel to the largest faces, and they may be bent. They are 2 in the scale of hardness. Selenite forms rapidly on the surface of clay from the decomposition of iron pyrites and calcareous fossils in moist air.

Selenium (symbol, Sz ; atomic weight, 78.9), a rare non-metallic element, occurs to a small extent in certain iron pyrites, and, owing to its presence in this source, sometimes in deposits in the lead chambers used in the manufacture of sulphuric acid. It was in these deposits in Fahlun, in Sweden, that the element was first discovered by Berzelius in 1817. In most of its chemical properties selenium resembles sulphur, and is capable of existing in two allotropic forms. One of these is obtained as a reddish-brown powder by the reduction of the oxide of selenium, and is soluble in carbon disulphide. If melted and kept molten for some time, being allowed to cool very slowly, a crystalline variety is obtained. This form is insoluble in carbon disulphide, has a specific gravity of 4.6, and melts at $217^{\circ} C$. If strongly heated in air selenium burns, forming a dioxide SeO_2 , with a strong and peculiar odour. This oxide condenses to form needle-shaped crystals, and dissolves in water to form selenious acid, from which, by oxidation, a powerful acid (selenic acid) results. This acid is remarkable as being the only single acid which is capable of dissolving gold. It forms salts, known as the selenates, which in most points closely resemble the sulphates. With hydrogen, selenium forms a compound, SeH_2 , which is a combustible colourless gas, with a most penetrating and very disagreeable odour, powerfully attacking the throat and eyes. It is easily soluble, and resembles the corresponding sulphur compound, producing, in solution of most metallic salts, precipitates of metallic selenides. It was so-called from *seleno*, "the moon," because in many respects it resembled

tellurium (which had been named from *tellus*, "the earth").

Selenodont. [BUNODONT.]

Seleucia (Greek, *Seleukeia*), the name of several towns famous in ancient times, which owed their origin to the Seleucidae. One of these, on the left bank of the Tigris, founded by Seleucus I., attained great splendour, and at the height of its prosperity and supremacy supplanted Babylon and is believed to have maintained a population of 600,000. Of this superb city only a few ruins (25 miles S.E. of Baghdad and 40 miles N. by E. of Babylon) are the sole memorial. Seleucia Pieria, another city of the same date and founder, stood near the mouth of the Orontes, and was the port of Antioch, with which also, Apamea and Laodicea, it constituted the Syrian Tetrapolis.

Seleucus, founder of the Macedonian dynasty of the Seleucidae, was born about 358 B.C., and was surnamed Nicator or the Conqueror. He was a notable warrior under Alexander the Great, and served in Persia and India. Becoming satrap of Babylonia in 322, he fell into difficulties, which led to his flight into Egypt, whence he returned in 312, and, recovering Babylonia, assumed the title of king. He obtained enormous power, founded Antioch, Seleucia, and other cities, and gained great victories over Demetrius (286), and over Lysimachus (281). He was assassinated in 280.

Self-Induction, in electricity, is a property of electric circuits which causes electricity in some cases apparently to possess inertia. When an electromotive force is applied to a circuit, a magnetic field has to be created, and work must be done. This results in a back electromotive force, which, as it were, draws back the current, so that it only rises gradually to its steady value. The reverse effect occurs on breaking the circuit, as the lines of force, in closing up, generate an electromotive force which tends to keep the current flowing for a short time. Self-induction has an important effect on the action of alternate current apparatus.

Selim III. (1761-1808), Sultan of Turkey, was the son of Mustafa III., and when he ascended the throne in 1789 great expectations were excited by his known admirable qualities. He was, however, hampered by the Janissaries, who defeated his efforts at reform, and finally deposed him in favour of Mustafa IV., who caused him to be strangled. He had contracted alliances with the British and French at different times, and on Napoleon's successful invasion of Egypt it was the former who restored it to him.

Selkirk, the county town of Selkirkshire, Scotland, about 6 miles S. of Galashiels. It is beautifully situated on high ground some 2 miles below the confluence of the Ettrick and Yarrow, and 3 miles above the point where the Ettrick falls into the Tweed. It derives its name from the rude kirk among the shielings

which was raised when the district was first converted from paganism and preceded the Tironensian abbey which David I. transferred to Kelso in 1126. The early Scots kings had a hunting-lodge here, but scarcely any trace remains of the ancient castle. In those remote



SELKIRK.

(Photo: A. R. Edwards, Selkirk)

times the town was famous for its brogues, or single-soled shoon, and tradition has steadily maintained that in the disastrous battle of Flodden (1513) the "souters," or shoemakers of Selkirk, bore themselves with conspicuous valour. The principal manufactures now are tweeds, tartans, plaids and shawls, and leather, in addition to wool-spinning. The chief structures are the town hall and county buildings. Burgh courts are held in the old town hall, in which was the room where Sir Walter Scott used to preside as "Shirra," or Sheriff. There is a monument to Sir Walter in the Market Place, and one to Mungo Park, the African traveller, in High Street. Mungo began life as a surgeon's apprentice in the town. The quarters occupied in Selkirk by General David Leslie on the eve of the battle of Philiphaugh, two miles westwards on the left bank of the Yarrow, when the Marquis of Montrose suffered somewhat ignominious defeat (September 13th, 1645), are still pointed out. Pop. (1901), 6,292.

Selkirk, or SELCRAIG, ALEXANDER, the alleged prototype of "Robinson Crusoe," was born at Largo, Fifeshire, Scotland, in 1676. He was a seafaring man and had made several voyages before the fateful one in which, owing to a dispute with his captain, Stradling of the *Cinque Ports*, he elected to be put ashore on Juan Fernandez, a lonely Pacific island, some distance off the coast of Chile. This was in 1704, and it was not till 1709—four years and four months afterwards—that he was rescued by Captain Rogers. He did not return home till 1713, when only his mother recognised him. It has been doubted whether Daniel Defoe knew of Selkirk's unique experiences, but there is inherent probability that so wideawake a man

must have been familiar with what was perfectly notorious both through accounts published in London and the talk of the town. But there is no question that Selkirk was the theme of William Cowper's noble poem, "I am monarch of all I survey." Some relics of Selkirk still exist, such as the cup he used on the island, his firelock and his seaman's chest. He seems to have bought a house and garden in Largo, but the rover's blood was in his veins, and in 1717 he rejoined the navy and died in foreign parts, a lieutenant of *The Weymouth*, in 1728. A monument to his memory has been erected in Largo.

Selkirk Mountains, a range of mountains in the south-east of British Columbia, North America, extending northwards from the United States boundary as far as the great loop of the Columbia River. It has, on the east, the Purcell Range, and, still farther east, the main stem of the Rockies, and, on the west, the Gold Range, and, between this and the Pacific coast, the Cascade Range. Among the highest peaks are Mount Dawson (10,800 feet), Sir Donald (10,645 feet), Mount Donkin (9,700 feet), and Mount Macdonald (9,440 feet). The scenery almost everywhere is sublime, varied as it is with primeval forest and glaciers. The Canadian Pacific Railway crosses the range.

Selkirkshire, a southern inland county of Scotland, usually considered one of the Border counties, bounded on the N. by Edinburghshire, on the N.E., E. and S.E. by Roxburghshire, on the S.W. by Dumfriesshire, and on the W. and N.W. by Peeblesshire. It covers an area of 267 square miles. Its surface is hill and dale, being mountainous in the west and south-west, where heights of from 1,500 to nearly 2,000 feet are numerous, while a few exceed 2,000 feet, Dun Rig reaching an elevation of 2,433 feet. The chief rivers are the Tweed, which traverses a few miles of the northern district, and the Yarrow, which flows out of St. Mary's Loch and falls into the Ettrick, a few miles above the latter's confluence with the Tweed. The Ettrick rises close to the Dumfriesshire boundary and pursues a mainly north-easterly direction to the Tweed. It and the Yarrow are the distinctively Selkirk streams. St. Mary's Loch and the Loch of the Lowes, in the west, are the only lakes of any consequence. The shire was formerly designated the Sheriffdom of Ettrick Forest and its greatest Sheriff was Sir Walter Scott. The men of the Forest were famous fighters and did yeoman service for their country at Flodden in 1513, when the "flowers of the Forest were a' wede awa'." The Romans left few traces of their occupation, but of the first inhabitants there remain vestiges of the singular rampart or road called the Catrail, or Picts' Work, which began at the Cheviots and ended at Torwoodlee, near Galashiels. Much of the soil is under cultivation, but the uplands afford excellent grazing-ground and pasture for sheep and cattle, the sheep-walks especially being

heavily stocked. Granite and whinstone are quarried, but there are virtually no minerals. The manufactures comprise woollens and other textiles, hosiery, and leather, besides the dressing of sheep and lamb skins, and some engineering and machinery works. Among well-known natives were James Hogg the Ettrick Shepherd, Mungo Park and William Laidlaw. The hill country teems with memories of the Covenants, and the Marquis of Montrose was defeated at Philiphaugh in 1645. Pop. (1901), 23,356.

Selsey, or **SELSEA**, that is, Seals' Island, in evidence of the time when these animals frequented the spot, a parish on the coast of Sussex, England, $8\frac{1}{2}$ miles S. of Chichester. It is historically interesting as the original seat of the see of Chichester, St. Wilfrid, to whom it was granted, having built a cathedral here. The site was probably found too much out of the way and too exposed, for the see was transferred to Chichester, its present seat, in 1072. The locality, however, is extremely healthy, and there is a fine stretch of sandy beach. The fisheries, especially of lobster, prawn, and crab, form the only industry. The seaward face of the promontory is known as Selsey Bill. Pop. of parish (1901), 1,258.

Seltzer Water, a natural water which contains, together with certain quantities of mineral salts (e.g., chloride of sodium and sulphate of magnesia), a large amount of dissolved carbonic acid gas, which gives it its sparkling properties. It is found at the springs of Niederselters and Oberselters, two villages in Hesse-Nassau, Prussia, whence it derives its name. A water somewhat resembling the natural water may be prepared artificially by dissolving the salts in water and impregnating with carbonic acid gas under pressure, as in the various arrangements for the purpose sold under the names of seltzogenes, etc.

Selwyn, GEORGE AUGUSTUS, first Bishop of New Zealand, was born at Hampstead, London, on April 5th, 1809, and educated at Ealing, Eton and St. John's College, Cambridge. He took holy orders and in 1833 became curate of Windsor. In 1841, when the episcopacy was extended to the British colonies, he obtained the see of New Zealand, being consecrated in the same year. He acquired a working knowledge of Maori during the outward voyage and was thus enabled to begin an active ministry as soon as he landed. He won the confidence of the natives, and, in six years, having exhaustively visited the whole of his vast see, set out (in 1847) to visit the Pacific Islands, which by a clerical error had been included in his diocese. The result of his voyage was the creation of the see of Melanesia. On his visit to England in 1854 he obtained home rule in diocesan affairs and power to consecrate two bishops to the North and two to the South Island, becoming himself primate of New Zealand. In 1867, while attending the Pan-Anglican Synod in England he was trans-

ferred to the see of Lichfield, which he held till his death in that city on April 11th, 1878. His *Verbal Analysis of the Holy Bible* appeared in 1855, and several volumes of his sermons have also been published.

Semaphore (Greek, "sign-bearer"). In the days before the invention of the electric telegraph, a system of signal stations was erected from point to point along important routes by means of which messages were conveyed between distant towns with incredible celerity. The stations were strong towers built in commanding situations so that, with the aid of powerful telescopes, the signals displayed at the neighbouring station on either side could readily be deciphered and passed on. On the flat roof of each tower was raised the system of codes, at first consisting of two sets of shutters which, closed and opened in various combinations, conveyed the message, the shutters being operated inside the tower by winches. This cumbersome apparatus was afterwards replaced by a mast and arms, resembling the railway semaphore now in vogue. Richard Lovell Edgeworth (1744-1817) is credited with the invention of the semaphore which, of course, was abandoned (save for use on railways) as soon as telegraphy was perfected. Though it seems a crude method of signalling, at the same time the operatives were so vigilant and expert that it is said a message could be sent from London to Portsmouth and back in a minute.

Seminoles, North American aborigines, a branch of the Muskogean family, formerly



SEMINOLE INDIAN BOY.
(From Catlin's "North American Indians.")

powerful in Florida and neighbouring districts, but now numbering some 3,600, including about 500 in Southern Florida, all the rest having been removed to the Union Agency, Indian Territory. The Seminoles do not appear to have been the primitive inhabitants of Florida, which was first held by Timuquanan tribes; but after the expulsion of the Apalachi by the British in 1702-8, the Seminoles, with the kindred Yamasi, were the only natives in occupation of the peninsula. Here they were gradually compelled by the progress of white settlement to give up agriculture and take refuge in the watery district of the Everglades, where they lived by the chase and fishing till removed to Indian Territory.

Sempalatinsk, a province of Russia-in-Asia, belonging to the Governor-Generalship of the Steppes, bounded on the N. and N.E. by Tomsk, on the E. and S.E. by the Chinese province of Chuguchak, on the S. by the Russian provinces of Syr-Daria and Semirychensk, and on the W. by Akmolinsk. It occupies an area of 178,320 square miles. The surface is largely mountainous, portions of the Altai system (10,000 feet high) being found in the east, and of the Tarbagatai (9,000 feet) in the south, with vast stretches of steppe between. The Irtish is the principal river and Zaisan the chief lake. The whole country is undergoing rapid desiccation and the climate is very trying. Agriculture is the prevailing industry, wheat, oats, millet, potatoes, rye and barley being the leading crops, while great flocks of sheep, droves of cattle and horses, and herds of camels are raised. The mineral wealth comprises gold, silver, salt and coal. The industries are of small account and include distilleries, tanneries, iron-works and flour-mills. The capital is Sempalatinsk (26,353) on the right bank of the Irtish. Pop., 688,557, predominantly Kirghiz.

Semiramis, Queen of Assyria, reigned four generations before Nitocris, according to Herodotus, but she was probably a mythical personage. Diodorus of Sicily tells a remarkable story of her being deserted whilst a child by her mother, a goddess, and kept alive by doves. She is supposed to have founded, with her husband Ninus, Nineveh and other cities and monuments, and to have lived 2,000 years before the Christian era.

Semirychensk, a province of Turkestan, Russia-in-Asia, bounded on the N. by Sempalatinsk, on the E. and S. by the Chinese provinces of Chuguchak, Kulja, Aksu, and Kashgar, and on the W. by the Russian provinces of Fergana, Syr-Daria and Akmolinsk. It covers an area of 144,550 square miles. In the east and south the surface is mountainous, embracing parts of the Ala-tau and Tian-shan systems, but much of the rest is steppe and desert. The country is drained by the Ili, many streams flowing northwards to Issik-kul and other rivers. The lakes include Balkash

(400 miles long by 55 miles wide), Issik-kul and Ala-kul. Agriculture is the leading industry, wheat, oats, millet, barley, rice and potatoes being the chief crops, but oil-plants, flax, hemp, poppies and other plants are cultivated. The raising of live-stock is a pursuit of pre-eminent importance, there being vast flocks of sheep and great herds of horses, cattle, camels and goats. Fruit is grown in fertile, sheltered valleys, and bee-keeping is also general. The industries comprise distilleries, tanneries, flour-mills and tobacco factories, but weaving, saddlery, metal ware, felt goods and other domestic trades are pursued. Vyernyi (24,798) is the capital. Pop., 988,182, of whom the great majority are Kirghiz.

Semitic Languages, a conventional name given by Johann Gottfried Eichhorn (1752-1827) to a linguistic family, which Ernest Renan calls the Syro-Arabic, from the extreme northern and southern members of the group. There are four well-defined branches: (1) Assyrian of the cuneiform writings, extinct probably before the Christian era; (2) Aramaic, comprising the Syriac of Syria and parts of Palestine, extinct since the 9th or 10th century of the Christian era, and the Chaldean, still spoken by a few Nestorians and other religious communities in Mesopotamia and West Persia; (3) Canaanitish, comprising the Phœnician of the Palestine and south-west Mediterranean (Punic) coast-lands, everywhere extinct probably since the 5th century of the Christian era, and the Hebrew of the Israelites and Jews, which as a vernacular rapidly merged in the Aramaic after the Babylonian Captivity; (4) Arabic, comprising the Arabic proper of the greater part of Arabia, the language of the Koran, now current throughout the whole of Arabia, Mesopotamia, Syria, Palestine, Egypt, and most of North Africa, and the Himyaritic tongue of South-West Arabia (Yemen) and Abyssinia, all but extinct in Arabia, but surviving in more or less corrupt forms (Tigrina, Amharic, Harari, etc.) in Abyssinia. Although recent research has gone far to prove the original unity of Semitic and Hamitic speech, the relations are so slight, and go back to such a remote epoch, that Semitic must practically be regarded as an independent form of speech, belonging to the inflecting order, but fundamentally distinct from all other inflecting languages. It is distinguished, as might be expected from the mental temperament of the Semitic race, by great stability and persistence; so much so that the various branches may almost be regarded as little more than dialects of a long extinct Semitic mother-tongue. Certainly these branches differ far less from each other—Hebrew, for instance, from Syriac, or Assyrian from Arabic—than do many members of the different Aryan branches from each other—English, for instance, from Old High German in the Teutonic, or Hindi from Sanskrit in the Indic branch. "On comparing," remarks Renan, "the Chaldean of the frag-

ments of Esdras, representing the Aramaic of the 5th century B.C., with the Syriac still written in our day, scarcely any essential differences can be discovered between texts composed at so long an interval. Between these two limits Aramaic may be said to have varied no more than the language of Cicero from that of Ennius." The most striking features of Semitic speech are: (1) The strong phonetic system, with several deep gutturals (*kh*, *q*, *gh*, etc.) unpronounceable by Europeans, yet preserved for thousands of years in the hottest inhabited region of the globe; (2) The trisyllabic verbal roots, consisting mainly of three consonants (trilateral, with a few biliteral, quadriliteral, and pluriliteral), "moved" by vowels, but never changed in sound or sequence in any of the branches. Thus from root *qtl* = "kill," Arabic *qatala*, Hebrew *qatal*, etc., "he killed"; (3) The remarkable verbal process, without analogy in any other language, by which from this trilateral root were developed, chiefly by internal vowel change and prefixed servile letters (*h*, *t*, *n*, *s*), as many as 15 thematic forms (intensives, reciprocals, causatives, reflexives, iteratives, etc.), in the Semitic mother-tongue, of which 12 or 13 are preserved in Himyaritic, 11 in Arabic, 5 in Hebrew, and more or less in the other branches. Thus Arabic, *qatala*, *qātala*, *haqtala*, *taqatala*, *kingatala*, *histaqtala*, etc., each with active and passive voice, personal endings, participles, gender, but two tenses only, the complete and incomplete; for acts are thought of by the Semitic mind, not as taking place in past, present, or future time, as they are thought of by the expansive Aryan mind, but as either done absolutely (past) or as not complete at the time of fact last mentioned, the incomplete or "imperfect" thus vaguely answering to the English present and future. The verb also incorporates both the direct and indirect personal objects; but in other respects Semitic inflection is poor. Declension is restricted to three cases (subjective, possessive, and objective), feebly marked by nasalisation; there is little adjectival change; the dual is confined to the noun; there is no neuter gender and no optative and no word-building by prefixes or other process. Peculiar to the Arabic branch are the so-called "broken plurals" on which, being really singular collectives, secondary plurals may be built. There are over thirty typical forms, such as *jawhar*, "a gem," *jawāhir*, "jewellery"; *amir*, "prince," *ummarā*, "the aristocracy"; *qarib*, "a relation," *aqribā*, "kindred"; *khabar*, "news," *akhdār*, "tidings"; *kāfir*, "unbeliever," *kuffār*, "the infidel." Several of these or analogous forms survive in the cognate Himyaritic, but the principle on which they have been developed has disappeared from all the other members of the Semitic family. All the Semitic languages except Assyrian are written in various forms of an alphabet attributed to the Phœnicians, and ultimately traceable to a hieroglyphic (Egyptian or Babylonian) source.

This graphic system runs from right to left and makes originally little provision for the vowel sounds, except in the Himyaritic of Abyssinia, which reverses the order and develops a full vocal series by a uniform modification of the consonants. Apart from the Assyrian now being revealed by the decipherment of the cuneiform writings, Semitic literature has been successively cultivated, first by the Jews (Hebrew period closing with the 6th century B.C.), then by the Aramæans (from the 6th century B.C. to the 7th century after Christ), and, lastly, by the Arabs (from the 7th century down to the present day). The two first are mainly religious, the third religious and general. (Renan, *Histoire Générale des Langues Sémitiques*.)

Semitic Race, a main division of the Caucasian stock, whose original domain was confined to the south-west corner of Asia—that is, the region comprised between the Iranian plateau and the Persian Gulf on the east, and the Red Sea and Mediterranean on the west, with no clearly-defined limits towards the north. From this relatively narrow territory the Semites spread in prehistoric times to the Ethiopian highlands (Abyssinia), and along the southern shores of the Mediterranean, and in historic times to nearly the whole of North Africa, to the East African coast-lands beyond the Zambesi, and to parts of Persia, India, and Malaysia. The name is purely conventional, being taken, for want of a better, from Sem (Shem), their assumed progenitor, although the Biblical genealogies make no claim to scientific accuracy. Apart from the doubtful Hittites, there are five great historical groups: (1) The Assyrians of Mesopotamia; (2) the Aramæans (Syro-Chaldeans) of Syria, parts of Palestine and the Lower Euphrates; (3) the Canaanites (Hebrews, Phœnicians, Carthaginians and others) of Palestine and the Mauritanian seaboard; (4) the Arabs of the greater part of the peninsula named from them; (5) the Himyarites of south-west Arabia (Yemen) and Abyssinia. Of these all but the Jews and Abyssinian Himyarites have either disappeared or else been assimilated in speech to the Arabs, who may be said to have absorbed nearly all other members of the Semitic family much in the same way that the Latins absorbed all other members of the old Italic family. The type, as best represented by the Assyrians of the ancient monuments, by the Jews and Arabs, offers considerable diversity in the details, but is essentially Caucasian in its main characters, being distinguished by perfectly regular and expressive features, fine oval face, large and often aquiline nose depressed at the root, small pointed chin, forehead straight but not high, black almond-shaped eyes, moderately dolichocephalic head, glossy jet-black hair, full beard, skin fair but easily bronzed by exposure, stature rather below the average European. This type approaches nearest to the Hamitic, at least as represented by the Berbers, and

there are linguistic and other reasons for assuming a primitive Hamito-Semitic race, whose original home may have been either in North Africa or South-West Asia, whence the two branches diverged long before the oldest Babylonian and Egyptian records. Compared with the Aryan, the Semitic intellect may be described as less varied, but more intense, a contrast due to their monotonous and almost changeless environment of yellow sands, blue skies, flora and fauna limited to a few species and mainly confined to oases and plains reclaimed by irrigation from the desert. Hence to the Semites mankind is indebted for little philosophy and science—though such exceptions as can be made to this generalisation are extremely strong ones—but for much sublime poetry associated with many profound conceptions of a moral order, resulting in the three great monotheistic religions of the world—the Jewish, Christian, and Mohammedan. Expansion and progress are the dominant characteristics of the Aryan, concentration and immutability of the Semitic, intellect.

Semler, JOHANN SALOMO, theologian, was born at Saalfeld, in Saxe-Meiningen, Germany, on December 18th, 1725. He was educated at Halle University, and became its professor of theology in 1751, which post he retained till his death. He was also director of the theological faculty at Halle. He died at Halle on March 14th, 1791. His writings are chiefly interpretations of the Old and New Testaments, and, though slightly rationalistic, are considered of much importance. He rejected the dogmas of the equal value of both the Old and the New Testament, of the uniform authority of all parts of the Bible, of the divine authority of the traditional canon, of prophetic inspiration and the identification of revelation with Scripture. Among his works were *De Dæmoniis* (1760), *Selecta Capita Historiæ Ecclesiasticæ* (1767), *Abhandlung von freier Untersuchung des Kanons* (1771), *Apparatus ad Liberalem Novi Testamenti interpretationem* (1767) and *Veteris Testamenti* (1773).

Semmering, a mountain and pass on the borders of Styria and Austria, 45 miles S.W. of Vienna. The railway from Vienna to Trieste via Gratz has been carried across these Alpine summits by a series of remarkable engineering exploits. The Semmering section (constructed at a cost of £2,000,000) begins at Gloggnitz in Lower Austria, and ends at Mürzzuschlag in Styria, a distance of 25 miles. Between these points the permanent way pierces 15 tunnels, is conveyed over 16 viaducts (some of which are most imposing structures), and climbs in many curves up the mountain sides only to steal down in similar serpentine fashion on the other side. The Semmering tunnel, where the greatest altitude (2,940 feet) is made, is 4,692 feet long. The scenery of the whole region is of surpassing beauty, and Viennese especially resort to the district alike for health and holiday.

Semolina, a farinaceous food, consisting of the large hard parts of wheat, which remain in the bolting machine when the fine flour has disappeared. It is used for making puddings and soups.

Sempach, a town in the canton of Lucerne, Switzerland, on the south-eastern shore of the small lake of Sempach, 8 miles N.W. of Lucerne. It is memorable for the victory of the Confederated Swiss, 1,500 strong, over 4,000 Austrians, under Duke Leopold, on July 9th, 1386. Yet it seemed as if the mountaineers were doomed to defeat, for they could not pierce the wall of pikes which hedged their hated foes, when Arnold von Winkelried of Unterwalden, heroically grasping as many pikes as he could hold, plunged them in his breast, and through the breach thus formed his brave fellow-countrymen poured and played havoc with the mail-clad Austrians. Leopold and 263 of his followers were left on the field. A column surmounted by a lion was erected in 1886 on the 500th anniversary of the victory, and about a mile and a half to the north-east of Sempach stands the chapel which marks the spot where the Duke fell. Seventy-one years earlier (November 15th, 1315), at Morgarten, in the canton of Schwyz, the Confederates had won their first victory, when another Duke Leopold, uncle of the present one, was defeated. These triumphs led up to the independence of Switzerland.

Semper, GOTTFRIED, architect, was born at Altona, Schleswig-Holstein, Germany, on November 29th, 1803. He studied law at Göttingen, but speedily abandoned it for art, which he sedulously cultivated, giving particular attention to architecture and design, at Berlin, Dresden, Munich and Paris, also visiting Italy and Greece. An accomplished classical scholar, his sympathy with the spirit of the highest examples of the ancient masters was profound, and, an equally able mathematician, the laws of perspective, form, and projection came to him with consummate ease. He was appointed Professor of Architecture in Dresden in 1834, and had many opportunities for the practice of his art. Apart from Royal commissions, he designed the opera-house and the new Pinakothek. His stay in Saxony was abruptly ended in 1848, for his active support of the Revolutionary movement provoked the king's anger, and led to his exile. He ultimately came to London and acted as an adviser to the Prince Consort in connection with the Great International Exhibition of 1851. Two years later he was called to Zürich as professor of architecture, and designed several buildings in that city. After spending a few months in Vienna in 1870, where extensive building operations were contemplated at the Ring, he was summoned to Dresden next year to prepare designs for a new opera-house, the former edifice having been burned down. Semper died in Rome on May 15th, 1879. He was a fervent advocate of polychrome and

thoroughly appreciated the mutual interdependence of architecture, sculpture and painting.

Sen. KESHUB CHUNDER, theologian and reformer, was born in the Presidency of Bengal, India, on November 19th, 1838. Attracted by the doctrines of the Brahmo Somaj (Hindu-theism), founded by Rammohun Roy in 1830, he joined the Society at the age of twenty and soon became an eloquent expounder of its tenets. In course of time, however, he



KESHUB CHUNDER SEN.

evinced a tendency to mingle with it Christian modes of thought and expression and to translate it into a species of Christian Unitarianism. In 1870 he visited London, where he preached in South Place Institute and held a great meeting in St. James's Hall, at which many distinguished men and women were present. According to Moncure D. Conway's *My Pilgrimage to the Wise Men of the East*, which has all the interest of autobiography, the impression he created was not wholly favourable, and it appeared as if "he had come to England to teach, not to be taught, which was what he needed." He even seemed to hold "some vague Messianic theory of his mission" and, when criticised because he did not prevent certain followers from kneeling and worshipping him, said "he did not like to stop the flow of devout religious feeling." After his return to India his views departed farther away from their original standpoint and, in 1878, he headed a secession church, which was named the Sadharan (Universal) Brahmo Somaj. His mysticism, however, grew upon him, and in later years his influence declined. He died in Calcutta on January 8th, 1884. He was infirm of purpose and his convictions therefore lacked stability, and his reform work suffered accordingly. "I had some hopes of him," writes M. D. Conway, "when he led his people into the

movement for the suppression of infant marriages, but in the midst of it all he gave his own infant daughter in marriage to a little personage of title [a Hindu maharajah] and that was fatal to his general influence."

Sénancour, ÉTIENNE PIVERT DE, romanticist, was born in Paris in November, 1770, and was destined by his parents for the priesthood, but he ran away, and, going to Switzerland, married there. Financial embarrassment drove him back to Paris, where he began to write for a livelihood. During the reign of Louis Philippe he was granted a pension. His principal works are his *Obermann* (1804) and *L'Amour considéré dans les lois réelles* (1805), which have been often reprinted, although the former was ignored for several years after its publication and it was not till 1830, when Sainte-Beuve and George Sand took it up, that the book became the rage. This probably encouraged the author to produce a sequel, *Isabelle* (1833), which, however, met with comparatively little success. He was much influenced by Rousseau, and wrote several sentimental reveries of a deistical nature. Sénancour died at St. Cloud on January 10th, 1846.

Senate, a deliberative assembly of the citizens of a State who are vested with a share in its government. In old Rome it was at first composed exclusively of patricians, but latterly wealthy plebeians were admitted to membership. Its power was supreme in matters appertaining to religion, law and foreign affairs, but by the period of the republic and empire it was stripped of most of its authority, except as a judicial tribunal and in certain administrative functions, chiefly fiscal. Under the patricians it numbered 100, which gradually increased till it exceeded 1,000 after the assassination of Julius Caesar. Augustus reduced it to 600. The decree of the Senate of ancient Rome sitting as a high court of justice was called *Senatus consultum*. The Upper House, or Second Chamber, in the United States, France and Italy is designated Senate. In the United States it consists of two senators from each State, who are elected by the State legislatures, sit for six years, and are presided over by the Vice-President of the Republic. In France the Senate numbers 300 and is elected by an electoral body, 225 for nine years and 75 for life. In Italy the number is unlimited and election is for life on the nomination of the Sovereign, with the proviso that membership shall be strictly reserved to men who have distinguished themselves in letters, science, art, or some branch of the public service. In some universities, as the four Scottish ones and Cambridge, the governing body is known as Senate or *Senatus academicus*.

Sendai, a town in the province of Rikuzen, in the island of Hondu, Japan, not far from a bay of its own name on the east coast, 170 miles N. by E. of Tokyo. It has manufactures of silk

and lacquer and drives an active trade through its port of Shiwogama, with which it communicates by tramway. Pop. (1903), 100,230.

Seneca, LUCIUS ANNÆUS, philosopher and man of letters, was born at Corduba, in Spain, about the beginning of the Christian era, and was taken to Rome at an early age. He became an advocate of some note, but in A.D. 41 was banished by Claudius to Corsica for several years on a charge brought against him by Messalina of scandalous fame. Agrippina, after her marriage with Claudius, procured, in 48, his recall, and he was appointed tutor to her son Nero, with whom he became a great favourite. He acquired enormous riches, and these were probably the cause of his downfall; for it is believed that the charge of conspiracy brought against him by Nero in 65 was merely a pretext for obtaining his wealth. He was ordered to destroy himself, and succeeded in doing so after some trouble. He was a Stoic and a sage, but he did not exert himself in inculcating virtue in his pupil, and he even excused Nero's murder of his mother. He wrote much, and his works have often been reprinted, notably *De Consolatione*, *De Ira*, *De Vita Beata*, *De Animi Tranquillitate*, and *De Providentia*. Some tragedies, which are artificial imitations of Greek models, are also ascribed to him, probably with good warrant, but they accentuate all the defects of his style at its worst.

Senega. There are two preparations made from senega root (*Polygala Senega*) in the Pharmacopœia: an infusion and a tincture. They are often administered alone or in combination with other remedies in bronchitis and other lung affections, with a view of increasing mucous secretion and promoting expectoration. The drug is said to have been used as an antidote for the bite of the rattlesnake by the Iroquois Indians, who were called Senecas, which is held to be the same as Senega. Crude petroleum is sometimes styled Seneca oil, because it was first gathered and used by the Senecas in their religious rites.

Senegal, a river of French West Africa, rising in the highlands of Futa Jallon, and formed by the confluence (in 13° 50' N. and 10° 50' W.) of the Bafing (Black River) and the Bakhoy (White River). It flows north-west as far as Mafu, and then, turning west and south-west, enters the Atlantic at St. Louis, after a journey of some 1,000 miles. In its upper reaches navigation is repeatedly interrupted by falls and rapids, but vessels of moderate draught can ascend from the ocean as far as the cataract of Felu, south-east of Kayes, up to which point there is regular communication by steamer. It receives the Faleme on the left and the Kolimbine on the right.

Senegal, a French colony in West Africa, which takes its name from the river Senegal, bounded on the N. by the French Civil Territory of Mauritanie (constituted in 1904 and

comprising the Trarza, Brakna, Gorgol and Guidimaka tribes of the coast hinterland north of the Senegal), on the E. by the French colony of Upper Senegal-Niger, on the S. by Portuguese Guinea (excluding the British Gambia), and on the W. by the Atlantic. Its area is indeterminate, but has been put as high as 200,000 square miles. The surface is mostly low-lying and much of it is infertile and desert, but the valley of the Senegal is well wooded and productive, yielding oil-seeds, castor beans, ground-nut, sesame, cocoa-nut, maize, millet, rice, acacia gum, kola nut and rubber. Live-stock are raised in fair numbers, and this industry is one that will repay attention. The minerals include gold, silver, quicksilver and copper. The natives are occupied to some extent in weaving, brick-making, pottery and the manufacture of jewellery. St. Louis (24,070) is the capital, Dakar (18,447), a fortified naval station, is the seat of the Governor-General of French West Africa, and other towns are Rufisque (12,446) and Goree (1,560). A railway connects St. Louis, Dakar and Rufisque. Pop. (estimated), 2,000,000.

Senegambia, the name given to the tract of country in West Africa which is drained by the Senegal and the Gambia rivers. Its limits are still undetermined, but the Atlantic bounds it on the W., the Guinea states on the S., the Soudan on the E., and the Sahara on the N. The whole area may roughly be estimated at 400,000 square miles. The seaboard, especially in the south, is flat, swampy, and covered with rank vegetation, but the country rises inland to a mountainous ridge having an elevation of three or four thousand feet, is watered by many rivers, and is fairly fertile and healthy. Millet, rice, maize, sugar, indigo, tobacco, cotton, oranges, figs, and other tropical plants are grown, but only for home use. The French colonies of Senegal and Upper Senegal-Niger occupy the bulk of the area, to which physically, though not politically, the British Gambia and Portuguese Guinea may be said to belong. The population (roughly estimated at 7,500,000) chiefly consists of negroes, with an infusion of Berbers of Arab blood, Europeans being very few. In 1902 France had constituted the Territories of Senegambia and the Niger, but two years later they were reorganised as the Colony of Upper Senegal and Niger, the old Senegal Protectorate being restored to Senegal. The new area was bounded on the N. by the Algerian sphere of influence in the Sahara, on the W. by the Faleme, on the S. by the northern frontiers of the Ivory and other Guinea Coast tribes and Northern Nigeria, and on the E. by a line drawn northwards from Lake Tsad. Bamako on the Niger is the capital. Pop. of colony (estimated), 4,000,000.

Senior, NASSAU WILLIAM, political economist, was born at Compton Beauchamp, Berkshire, on September 28th, 1790, and educated at Eton and Magdalen College, Oxford. He was called to the bar in 1819, but, owing to a weak voice,

confined himself to conveyancing and chamber practice. He found in political economy a life-long hobby. He joined the Political Economy Club in 1823, was appointed first Henry Drummond Professor of Political Economy at Oxford from 1825 to 1830 (occupying the chair again from 1847 to 1852), prepared for Lord Melbourne a report upon trade combinations, was a member of the Poor Law Commission of 1833, and wrote the famous report upon which the Poor Law of 1834 was based. He accepted a Mastership in Chancery in 1836, retaining the post till the office was abolished in 1855, but he varied his labours by sitting on the Factory Commission (1837), Hand-loom Commission (1841), Irish Poor Law Commission (1844), and the Education Commission (1857). He was the intimate of the literary men of his time and on the friendliest terms with Count Cavour, Alexis de Tocqueville and other eminent Continental statesmen. He died in London on June 4th, 1864. Besides publishing numerous lectures and letters on his favourite subject, he published *An Outline of the Science of Political Economy* (1836), *American Slavery* (1856), *Biographical Sketches* (1863), and *Essays on Fiction* (1864), and there appeared posthumously *Historical and Philosophical Essays* (1865), *Journals, Conversations and Essays relating to Ireland* (1868), and volumes of his Correspondence and Conversations with de Tocqueville, Thiers, Guizot, and other great men.

Senlac, the hilly ground five miles north-west of Hastings, in Sussex, where on October 14th, 1066, William the Conqueror defeated the English under Harold. It is now occupied by the pleasant little town of Battle, where are the ruins of the abbey erected by the Norman victor in commemoration of his triumph. It was a sore point with E. A. Freeman, the historian, that he could not induce folk to designate the fight the Battle of Senlac instead of the Battle of Hastings. No doubt the change will be effected gradually, and it certainly seems inevitable, for it would be just as correct to call Bannockburn the battle of Stirling, or Culloden the battle of Inverness, as it is to call Senlac the battle of Hastings.

Senlis, a town of the department of Oise, France, on the right bank of the Nonette, a tributary of the Oise, 26 miles N.N.E. of Paris. It is a place of great antiquity, dating back to the Roman Occupation, when it was a stronghold of the Silvanectes. Its old walls, 23 feet high and 13 feet thick, are the most perfect in the country. Its interest archaeologically and its beautiful situation adjacent to the forests of Chantilly, Halatte, and Ermenonville make the town especially attractive. The principal buildings are the cathedral of Notre Dame, begun in the 12th century, the collegiate church of St. Frambourg, also of the 12th century, the episcopal palace, the ecclesiastical college of St. Vincent, St. Peter's Church (now put to other than sacred uses),

and the town-house. The ruins of the castle and remains of the Roman amphitheatre should be mentioned. Market-gardening flourishes, and tanning, brick- and tile-making and dyeing are carried on. Pop. (1901), 7,115.

Senna, the leaflets of various species of the leguminous genus *Cassia*, containing a nauseous volatile oil and a purgative principle known as cathartic acid. The plants vary in size, but their leaves are pinnate, and the leaflets are distinguishable from adulterants by being slightly oblique at their bases. *C. acutifolia* and *C. angustifolia* are shrubs, the one, known as Alexandrian or Nubian Senna, native of tropical Africa from Timbuctoo to Nubia; the other, known as Bombay or Tinnevely Senna, native of Somaliland, Arabia, and the Punjab. *C. marilandica* is the source of American Senna. In addition to a cathartic acid, the leaves contain oxalic, tartaric, and malic acids. The principal preparations of senna are the syrup, tincture, infusion, confection, and the compound senna mixture, or "black draught." The dose of the last named is 1 to 1½ fluid ounces. The action of senna is to stimulate the muscular coat of the intestine, and black draught is one of the most commonly employed among purgative preparations.

Sennaar, or SENNAR, a district of the province of Khartum, Anglo-Egyptian Soudan, lying between the White Nile, which divides it from Kordofan and the Blue Nile, which separates it from the territory adjoining the western borders of Abyssinia. Its area has not been determined. It belongs to the moist zone of the Nile Valley and is known to the Arabs as the island of Sennaar. Much of it is fertile, and there are great patches of forest. In the rainy season the heat is almost insufferable, and in the dry season it wears an arid and uninviting look. Under cultivation the soil, largely alluvial, yields fine crops of maize, pulse, cotton, tobacco, sesame and durra, and among the trees are the baobab, the tamarind, several palms, dyewoods, ebony, ironwood and acacias. The fauna includes the rhinoceros, hippopotamus, crocodile, lion, various antelopes and baboons. Iron, silver, gold and copper are said to exist in the hilly region to the east and south-east. The natives carry on weaving, pottery, saddlery and metal work, but the raising of live-stock and tillage are their leading industries. Sennaar, on the left bank of the Blue Nile, is the capital. The population has not been ascertained.

Sennacherib, King of Assyria, son and successor of Sargon, ascended the throne in 705 B.C. He had almost at once to resist the attempt of Merodach-baladan, king of Babylonia, whom he signally defeated, but who had had such a hold upon the people that the country had to be laboriously reduced, city by city and tribe by tribe. He then set Bel-ibni, as a vassal king, upon the throne, though he proved faithless or incompetent, and was replaced by

Sennacherib's son, Asur-nadin-sum. When his conquest was complete, the great king next turned his attention to the nations on his Western frontiers and proceeded to ravage Syria and Palestine. By 700 he had subjugated all his neighbours and proceeded to carry war into parts of Asia Minor. His career of triumph continuing unbroken, he next embarked on a great expedition to Elam (Khuzistan), which its king countered by a successful assault on Babylon, which he captured and where he made his own son king (693). This nerved Sennacherib to a supreme effort, and the Assyrians and Elamites met in 691 at Halule on the Tigris. Apparently victory declared for neither side, but two years later Sennacherib again attacked Babylon, which he captured, sacked and almost razed to the ground, turning the waters of the Euphrates over its site. Of the last years of his reign no facts are known, though there is reason to believe that he led an expedition into Arabia and possibly undertook a second expedition into the West. He was assassinated in 682 by his son (or sons), who were jealous of the favour he showed to his (or their) younger brother Earhaddon, who succeeded him. He was the maker and magnifier of Nineveh and his object in humbling Babylon so thoroughly was probably to exalt his own city still more effectually.

Sens, a town of the department of Yonne, France, on the right bank of the Yonne, near its confluence with the Vanne, 62 miles S.E. of Paris. Its name preserves the fact that it was the capital of the Senones, one of the most warlike tribes of old Gaul and amongst the very last to accept the Roman yoke. The citizens, after their conversion, held out just as strenuously against the Goths, Saracens and Normans, the last of whom captured the place in 886, after six months' siege. It became the seat of several ecclesiastical councils, at one of which Bernard vented his venom on Abelard in 1140, and afterwards was noted for its attachment to the Church. In 1622 it was made an archbishopric, and although reduced in 1791 and suppressed in 1807, the archiepiscopal rank was restored in 1807. It was occupied by the Germans in the war of 1870-1. The cathedral of St. Étienne dates from the 12th century, but was raised on the site where St. Savinian built a small church to the Virgin at the close of the 3rd century. The portals exhibit remarkably fine architecture, and the two remaining bells are famous in campanology—La Savinienne weighing 15 tons 7 cwt., and La Potentielle 13 tons 13 cwt. In 1234 Louis IX. married Marguerite of Provence in the cathedral, and five years afterwards deposited here the Crown of Thorns—a relic the custody of which was no doubt responsible for the perfervid zeal of the townsfolk. Other notable structures are the church of St. Savinian, who converted the Gallic tribe settled here, the archbishop's palace, the public library, the

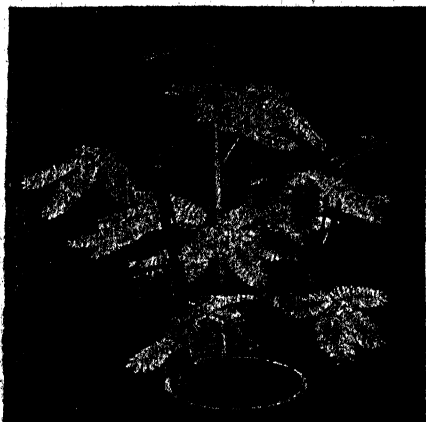
antiquarian museum, and the Dauphin's Gate, the only city gate remaining. Pop. (1901), 14,962.

Sensation, a state or modification of consciousness, supposed to be caused by a stimulus acting on the nervous system and transmitted to the brain through the afferent nerves. Sensations fall into three classes: (1) those which are attributed to the impact of some external object on the special organs of sense; (2) those which fall under the head of general sensibility, such as the comfort or discomfort attending the action of the digestive organs; (3) those which accompany muscular activity, the stimulus being apparently derived from the adjustment of the muscles, tendons, and joints. The Association psychologists commonly speak as though each sensation were a separable unit assignable to some one cause or agent, but against this view there is a twofold objection. In the first place, the single simple sensation is a mere ideal; practically every sensation contains representative elements, i.e., elements derived from past experience; and, secondly, the interaction of the various factors which produce sensation is much greater than is commonly supposed. Thus there can be no doubt that in sensations of taste a tactile or olfactory element is frequently present. Again, the changes in quality which accompany the increase or decrease of the stimulus applied to a special sense point to a mysterious complexity which lies altogether beyond our present means of analysis. This observation may be extended to the sensations of pleasure and pain which arise in connection with those communicated through the sense organs. The correct view would therefore seem to be that sensation is a complex whole, the segregation of which into parts is due to reflection rather than intuition. On this ground it may be maintained that the phenomena of consciousness presented by the special senses are merely modifications of a fundamental mass of general sensation, but as yet we possess no clue which would enable us to trace the differentiation.

Senses, popularly defined, the organs by the nerves of which various impressions are conveyed to the brain. It is commonly said there are five senses, those, namely, of hearing, sight, taste, touch, and smell. Some physiologists have contended for a sixth sense, the muscular apart from touch, and Aristotle maintained there was an inner sense, common sense, which, however, shows extraordinary agility in eluding definition. It has been assumed that there are seven senses, for the whole seven have been spoken of as representing consciousness in its totality.

Sensitive Plant (*Mimosa pudica*), a branching South American annual belonging to the sub-order Mimoseæ of the order Leguminosæ, now naturalised in many tropical countries and common in hot-houses. The leaves are bipinnate, with two or three pairs of pinnae, each

with a large number of small pinnules. These are exceedingly sensitive to contact, assuming the nocturnal position immediately on being touched. [SLEEP IN PLANTS.] The seat of the



SENSITIVE PLANT (*Mimosa pudica*).

(Photo: E. J. Wallis.)

movements is the parenchymatous swellings (*pulvini*) at the base of each leaflet, petiole and petiole, and the movement is produced by an influx or efflux of water in the cells of one side of these structures. The conduction of the stimulus is effected by the continuity of the protoplasm through the cell-walls in the *pulvini*. The leaflets fold together down their midrib (conduplicate), each pinna then falls to an oblique downward direction, and then the main petiole falls similarly. Sudden variations in temperature or in intensity of light, electric and chemical stimuli, produce the same effects as contact.

Seoul, or SEUL, the capital of Korea, on the right bank of the Han, 30 miles E. of Chemulpo, its port on a bay of the Yellow Sea. It is surrounded by a wall from 20 to 30 feet high, and within the enclosed area are two granite peaks, of which Pukasan, on the north, is some 1,300 feet high, while Namean, on the south, is of lesser elevation. The principal buildings are the Roman Catholic Cathedral, the Imperial Palace, and the Legations. Most of the native houses are built of adobe, or sun-dried mud, thatched with straw, and many of the streets look mean and dirty. The former law restricting the erection of temples has been repealed. There are several schools, including one for teaching English, two hospitals, and a few newspapers. Tramways (electric) have been laid down in some streets, the telephone is in use and railways connect the city with Chemulpo, Fusan and other places. Pop. (1902), 196,646.

Sepal. [CALYX.]

Sepia, a brown pigment prepared from the deep brown secretion of the sac, or "ink-bag," of the cuttle-fish (*Sepia officinalis*). The agents of artists' colour-men usually visit the districts (as, for instance, the southern counties of England) where cuttles are caught and collect the dry ink-bags. Henry Lee says he saw in one famous establishment in London thousands of raw bags, the contents of which were to be manufactured into sepia. Real sepia cannot be made from any other substance, and though lamp-black may be used as a substitute, it is a substitute and not sepia. If the Newfoundland fishermen when Squid-jigging would but take the trouble to keep the ink-bags intact, Lee had no doubt they would find them a profitable perquisite. It is a natural pigment of unique excellence, since it admits of remarkable evenness of tint, whether the shade be light, dark, or medium, and consequently many drawings have been made in sepia alone. The drawings with which Cuvier illustrated his *Anatomy of the Mollusca* were executed with the ink which he had collected while dissecting many specimens of Cephalopoda. Even in Roman days it was used for writing, for which purpose Cicero employed it. The cuttle discharges its ink on the smallest provocation and with astonishing rapidity, while the quantity of water the secretion will obscure is wonderful. Henry Lee, who still remains the principal authority on aquarium management, often saw a cuttle completely spoil in a few seconds all the water in a tank with a capacity of 1,000 gallons. The mollusc uses the ink to facilitate its escape from its enemies, a habit quaintly described by Du Bartas:—

For, when she sees her selfe within the net,
And no way left but one from thence to get,
She suddenly a certaine ink doth spew,
Which dyes the waters of a sable hew.

Sepoy, a Hindoo or other Indian foot soldier drilled by a European officer and wearing the uniform of a European regiment. It is derived from the Persian *sipahi*, and apparently originally meant a horse soldier. The word was in use in Southern India before British rule began in the peninsula, and the theory is that it was introduced into English from the Portuguese. Since the French conquest of Algeria, in Africa, *spahi*, a variant of the word from the same root, though under another form, has become current. The *spahi* differs from the *sepoy*, however, in being an irregular horseman. The word comes to the French from the Turks, among whom the *spahi* was always a horse soldier.

Sepia (plural of the Latin *septum*, "a wall"), a term employed to describe the plates of calcareous or fleshy material which divide the bodies of certain animals into more or less well-separated chambers; thus they occur between the body-segments of worms and also form the radiating plates which divide the cavity of corals into series of chambers or loculi.

Septaria, concretionary nodules of clay-iron-stones or impure limestone, in which the inner first-formed parts have contracted more than the outer, producing crossing series of cracks which have afterwards filled by infiltration with crystalline calcite. The clay-ironstone septaria occur in the shales of the Coal Measures, and the calcareous ones in many clays. Those in the London Clay, known to quarrymen as "turtle stones," are often of a grey earthy texture, traversed by lemon-yellow septa, and are cut and polished as table-tops. They range from six inches to several feet in diameter. They are largely collected in Sheppey and dredged up off Harwich for the manufacture of Roman cement.

September, originally the seventh month of the Roman year and hence the name (Latin, *septem*). When the Calendar was readjusted by Julius Cæsar, it was allotted the place of the ninth month, with the same number of days (30) that it had possessed from the first. It is the harvest month of the Saxons, is the month in which harvest homes or festivals are still most commonly celebrated, and corresponds partly to the *Fructidor* and partly to the *Vendémiaire* of the French Republic. The chief Church festivals belonging to it are the Nativity of the Blessed Virgin (8th), the Exaltation of the Holy Cross (14th), St. Matthew the Apostle (21st), and St. Michael and All Angels (29th). The Michaelmas Quarter-day also falls on the latter day.

Septennial Act. In 1641 triennial parliaments were established by law, but after the Restoration the Act was repealed. It was replaced on the statute book, however, in 1694, and remained in force until 1716, when, principally to avoid frequent appeals to the country during the ferment of the Jacobite intrigues, it was superseded by the Septennial Act, which is still operative, and in virtue of which no parliament may last longer than seven years from the date on which it is first summoned to meet. In actual working it is found that parliaments seldom endure for their full legal term, and, in point of fact, even the few that run their apparent time do not last for more than six years, since the period occupied by the dissolution and the consequent General Election are considered to form portion of the septennate.

Septicæmia. [PYÆMIA.]

Septuagint, THE, or Alexandrian Version of the Old Testament (from Latin *septuaginta*, seventy), is a translation of the Hebrew Scriptures into Hellenistic Greek, probably undertaken during the reign of Ptolemy (II.) Philadelphus (284-247 B.C.). The name is doubtless due to the legend related in the *Letter of Aristeas*, a forgery of early date, the author of which represents himself as a contemporary of King Ptolemy. According to this account, Ptolemy, in his zeal for learning, sent to Palestine for Jews to translate the books of the Old

Testament. The seventy-two (not seventy: the Company, to adapt the modern word, comprised six men from each tribe) learned men commissioned to execute the task were placed in seclusion on the island of Pharos, in Alexandria, and at the end of seventy-two days the version on which they had agreed was dictated to the librarian Demetrius. Internal evidence, furnished by the Septuagint itself, shows that the details of this story are fictitious. It was certainly translated by Alexandrian, not Palestinian, Jews, and differences of style and treatment show that it was the work of independent translators, separated by considerable intervals of time. The Septuagint furnishes valuable materials for Old Testament criticism; for differences in the arrangement of the books, as well as various omissions and additions, show that it was translated from a different text from that which has been preserved. It eventually supplanted the Hebrew Scriptures in Palestine itself, and from it are taken the quotations of Jesus recorded by the Evangelists. The Septuagint has much literary value as the great monument of Hellenistic Greek. It is, however, essential to bear in mind that, strictly speaking, it is only the Pentateuch to which the term Septuagint is applicable. The extension of the word to the whole of the Old Testament, however, if unhistorical is convenient, and since the usage dates from the time of Origen, who died about the middle of the 3rd century after Christ, it is sanctioned by a long period of prescription.

Séquard, CHARLES EDWARD BROWN-, physiologist and physician, the son of Edward Brown, a United States sea-captain, and Mdle. Séquard, a French lady, was born at Port Louis, Mauritius, on April 8th, 1817. He studied medicine at Paris and gave early proof of his skill and independence in research and investigation. He took up especially the whole question of the nervous system, including, of course, the spinal cord and brain. Amongst the academic appointments he held were the chairs of Physiology at Harvard (1864), Pathology in the École de Médecine, Paris (1869), and Experimental Medicine in the Collège de France, Paris (1878), in succession to Claude Bernard, in addition to posts on the staff of such hospitals as the Hospital for Epilepsy and Paralysis, London (1859). He was a Fellow of the Royal Society and member of the Institut. He died in Paris on April 1st, 1894. He wrote and lectured with equal facility in French and English, and published a large number of extremely valuable works, amongst which may be mentioned *Physiologie de la moëlle épinière* (1855), *Physiology and Pathology of the Central Nervous System* (1860), *Sur le diagnostic et le traitement des principales formes de paralysies des membres inférieurs* (1864), *Diagnosis and Treatment of Functional Nervous Affections* (1868), *Dual Character of the Brain* (1874), and on the *Hereditary Transmission of Effects of Certain Injuries to the Nervous System*

(1875). He was the founder of the *Journal de la Physiologie de l'homme et des animaux* (1858) and, along with Charcot and Vulpian, of the *Archives de Physiologie* (1868).

Sequels (Latin, "consequences"), a term employed in medical writings to describe symptoms or morbid conditions liable to follow particular diseases even after the diseases themselves have been cured. The normal course of the majority of complaints is towards recovery, but there are a few diseases which require to be carefully watched, even during the stages of convalescence and early recovery, not so much for relapse as for complication through the access of other disorders. Influenza, unfortunately, is a too common instance of the type of disease the after-effects of which may be much more serious than the disease itself. For example, pneumonia following influenza is a sequela of the most critical description. Other examples of sequels are kidney trouble after scarlet fever, paralysis after diphtheria, and heart affections after acute rheumatism. All such complications are so momentous that it is hardly necessary to emphasise the necessity for extreme precaution during convalescence when seemingly everything is going on satisfactorily. Impatience to get about again, especially after disease has been apparently subdued, may be natural, but has too often led to the loss of life.

Sequestum, a section of dead bone or cartilage which separates itself from the living surrounding bone or cartilage.

Sequin, or ZECCHINO, a gold coin of Venice, minted first about 1280, and issued until the



SEQUIN.

fall of the Republic. On the obverse was a design of St. Mark blessing the banner of the Republic held by the kneeling doge and on the reverse the figure of Jesus. Its value was rather more than nine shillings.

Sequoia, a genus of Coniferae named after a remarkable Cherokee Indian (Sequoiah or Sequo Yah, otherwise George Guess), who gave his tribe a written syllabic alphabet of eighty-six characters, and died in New Mexico in 1845. The genus is characterised by peltate cone scales, each bearing from five to seven seeds. There are only two living species, both natives of Western North America, *S. gigantea* (the Wellingtonia of botanical gardens, or Big or Mammoth Tree of Americans), and *S. sempervirens* (the Californian Redwood). The Mammoth Tree is a native of the Sierra

Nevada, and reaches over 1,000 years of age, considerably exceeds 300 feet in height, and 100 feet in circumference. It was discovered in 1850, and introduced into England in 1853.



CALIFORNIAN BIG TREE, SHOWING TUNNEL THROUGH TREE.

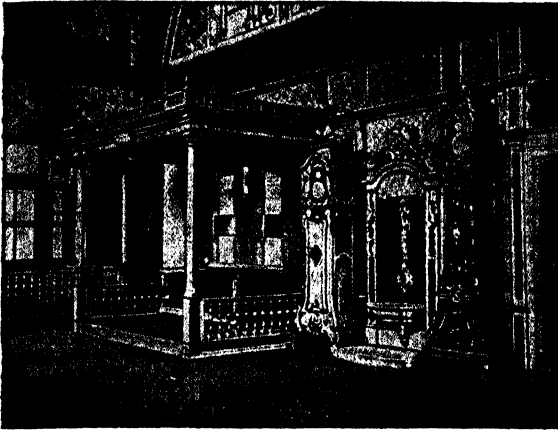
(Photo, copyright 1892, by W. H. Rau, Philadelphia.)

It grows well in deep clay soils on high ground. The Redwood has a wider range in latitude as a wild tree, and reaches 300 feet in height. It has shaggy, reddish bark and very dark foliage. Its wood is of good texture, but monotonous in grain. It is used to some extent in cabinet work, but is especially valuable for such purposes as fencing, telegraph poles and the like, since it is very durable in contact with earth. Fossil species of Sequoia occur in the Gault of Folkestone, the leaf beds of Mull (Eocene?), the Oligocene of Switzerland, and the Pliocene of Italy.

Seraglio properly means any enclosure (Italian *serraglio* from *serra*, "a bolt"), but its meaning in English is now identical with that of harem. The word has been confused with the Turkish *serai*, "a palace." The Seraglio (*Eski Serai*) at Constantinople, including mosques, the harem, etc., is now no longer the Sultan's residence.

Seraing, a town in the province of Liège, Belgium, 5 miles S.W. of Liège, on the right bank of the Meuse, opposite to Jemeppe, with which it is connected by a suspension-bridge. It was formerly the abode of the Prince-Bishops of Liège, whose palace was acquired in 1817 by John Cockerill (born, at Haslingden, Lancashire, on April 30th, 1790), by whom the site was utilised for the stupendous iron-foundry and locomotive works which, after his death, on June 19th, 1840, at Warsaw, was carried on by the Société Cockerill. William I. of the Netherlands lent this concern all the support he could, and was a partner in the business until 1835, his share of the capital amounting to £100,000. In 1871 a statue of John Cockerill was unveiled in Seraing. The great coal- and iron-fields of Belgium are in the immediate proximity of the town. Pop. (1900), 37,845.

Serampur, a town of Bengal, India, on the right bank of the Hoogly, opposite to Barrackpur, 13 miles N. of Calcutta. It was formerly a Danish settlement, but in 1845 it was ceded,



THE THRONE-ROOM IN THE OLD SERAGLIO, CONSTANTINOPLE.

along with the other Danish possessions in India, to the East India Company for £125,000. It is noted as the scene of the labours of the Baptist missionaries William Carey, Joshua Marshman and William Ward. The mission prospers and has founded a church, college, school and library. *The Friend of India*, the well-known weekly paper of Calcutta, was originally published at Serampur. There are manufactures of jute, paper and mats. Pop. (1901), 44,451.

Serao, MATILDE, novelist, the daughter of an Italian father and Greek mother, was born at Patras, Greece, in 1856. She began life as a schoolmistress in Naples, but soon attracted notice by her short stories. The promise they held out was more than fulfilled by her first novel, *Fantasia* (1883). She resided in Rome between 1880 and 1886, and her novels and tales published during this period are vivid pictures of Roman life and character. She then essayed journalism, founding the *Corriere di Roma*, which, when she removed to Naples, became the *Corriere di Napoli*. In 1902 she also established *Il Mattino*, which acquired a large circulation in Southern Italy. Meanwhile, however, she was still busy with her novel-writing, her later works including *Il Paese di Cuccagna* ("The Land of Cockayne"), *All' Ertà, Sentinella* ("On Guard, Sentinel"), and "In the Country of Jesus."

Seraphim are mentioned in the Bible only in the vision of the prophet Isaiah (vi. 2-6). They have six wings—a pair covered the face, another pair the loins and a third pair were used in flight,—but otherwise their attributes are human. They are seen hovering on either

side of the throne of the Almighty, proclaiming the *trisagion* in antiphonal chorus—"Holy, holy, holy, is the Lord of hosts; the whole earth is full of His glory." Their voices were so strong that the door-posts shook. Then one of the Seraphim flew to Isaiah with a "hot stone" from the altar and touched the prophet's mouth with it, in token of the purification of his lips. Jewish commentators regarded them as an order of angels, and were followed in their interpretation by the Christian Church. The word means "consuming," and is used in Numbers xxi. 6 of a poisonous kind of serpent. The idea conveyed is probably the "devouring fire" (cf. Isaiah xxxiii. 14) of the Almighty, suggested by the thunder-storm.

Serapis, SARAPIS, or OSARAPIS, an Egyptian deity, whose worship was introduced from Greece by Ptolemy (I.) Soter. He was identical with the Greek Hades, the ruler over the underworld. The name is said to be contracted from Osiris-Apis—i.e., the dead Apis, worshipped as Osiris. In Egypt, according to Professor Flinders Petrie in *The Religion of Ancient Egypt*, "the bull was sacred in many places, and his worship underlay that of the human gods, who were said to be incarnated in him." Figuratively the animal possessed a twofold symbolism—that of the fighting and that of the reproductive power. "The most renowned," adds Flinders Petrie, "was the Hapi or Apis bull of Memphis, in whom Ptah [the Creator] was said to be incarnate and who was Osirified and became the Osir-hapi. This appears to have originated the great Ptolemaic god Serapis, as certainly the mausoleum of the bulls was the Serapeum of the Greeks." The Egyptians who had remained unhellenised, however, refused to acknowledge the new god or to allow Serapea (temples of Serapis) to be built within the walls of their cities. The worship of Serapis gradually spread throughout Asia Minor, and in A.D. 146 was formally established at Rome by Antoninus Pius, but only to be abolished soon afterwards by the Senate.

Serbs (SRB, SOBB), the collective name of the Southern division of the Slav race (Yugo-Slavs), whose original home was the region of the Carpathians. Here many survived till the 9th or 10th century, and in Alfred the Great's time the Surpe (Surfe) were still seated on the Oder (Orosius i. 12); but the great bulk of the nation had already, in the 7th century, passed south of the Danube, where they rapidly overran a large part of the Balkan Peninsula, penetrating almost to the southernmost extremity of Greece. Later, through pressure of the Byzantines on the east, of the Bulgars on the north, and of the Albanians on the west,

the Serb domain was gradually contracted to its present limits, comprising the whole of Serbia, Bosnia, Herzegovina, Croatia, Dalmatia, Montenegro, and part of Istria, with a collective population exceeding 8,000,000 in number. Although politically dismembered, the Serb race preserves a strong national sentiment, which must form a potent factor in the future reconstitution of the Balkan Peninsula. This fellow-feeling is largely due to a community of traditions, usages, and especially language and literature, which present great uniformity throughout the whole of the Serb domain. Serbo-Croatian, as the common language is called, is the softest and most harmonious of all Slavonic tongues. Its well-preserved phonetic system gives it an important place in the family, and its literature is especially rich in national songs. A great number of these *pjesma*, as they are called, have been collected and published; many are undoubtedly very old, and the form in which they still exist shows how little the language has changed during the course of centuries.

Serge, a twilled worsted fabric with a rough surface, though there is one variety with one side woolly and the other smooth. The longer wool is used for the warp, the shorter for the woof, the former also being more twisted. The material is usually employed for women's dresses, children's clothes, and summer suits of the clergy and others. The stuff takes dye extremely well and can be made waterproof by special treatment. Navy serge is a thicker, heavier, and more durable quality made at the Government factory for the use of the British Navy. It is dyed a dark blue, which is so permanent that no amount of exposure to rain and wet will discharge it.

Sergeant (Old French *sergent*, from Latin *serviens*, "serving"), a non-commissioned officer next above a corporal in rank. His chief duties consist in maintaining discipline, teaching drill, and commanding small bodies as escort, etc. Sergeants have the overseership of the barracks, and are assistants to their officers in the field. Every company of infantry contains four sergeants, the senior being denominated the colour-sergeant. The sergeant-major, who ranks above the sergeants, does not hold any separate command, but is responsible for the general discipline of the corps. Serjeants-at-Law were barristers of superior degree having precedence over junior barristers. The status, however, has been abolished. Serjeant Ballantine was one of the last and few characters in humorous fiction are more familiar than Serjeant Buzfuz, who "led" for the plaintiff in the *cause célèbre*, *Bardell v. Pickwick*.

Sergipe, the smallest state in Brazil, bounded on the N. by Alagoas, on the W. and S. by Bahia, and on the E. by the Atlantic. It occupies an area of 15,090 square miles. The San Francisco is the principal river. In the fertile

hinterland of the coast cotton, cacao, sugarcane, manioc, tobacco, millet, rice and flax are cultivated, and in the higher country in the west live-stock are raised. Aracaju is the capital and sugar and rubber are the chief exports. Pop. (estimated), 400,000.

Series, in algebra, is any expression in which consecutive terms are formed in agreement with some regular law. Series are either finite or infinite, according as the number of terms is limited or not. In a finite series of n terms, the sum of these n terms is always some function of n , and has a certain definite value, but the sum of an infinite series may or may not have a definite value, according to the form of the series. The series is said to be convergent when its sum cannot exceed a certain definite value, however many terms we take; and it is said to be divergent when its sum can be made greater than any number we like to name, provided that we take a sufficient number of terms. If we can actually find the sum of n terms of an infinite series, we can at once discover whether the series be convergent or divergent by giving n an infinite value. For instance, the sum of n terms of the series

$$1 + x + x^2 + \dots + x^{n-1} = \frac{1 - x^n}{1 - x}.$$

If x be less than 1, this fraction becomes $\frac{1}{1 - x}$ when n is very great; hence the series is convergent. If $x = 1$, the series becomes $1 + 1 + 1 + \dots$ to n terms, and is therefore divergent. If x be greater than 1, the fraction can be written $\frac{x^n - 1}{x - 1}$

and can be made as large as we please by taking n great enough. The series is therefore divergent. In many cases, however, we cannot easily find the sum of n terms of an infinite series, and then special devices have to be used to determine whether the series be convergent or not. For these, the reader is referred to books on algebra. Series may be formed in accordance with various laws; hence different methods must be employed in their summation. A series of numbers in arithmetical progression, or in geometrical progression, can be summed by means of the general formulae, and a series partly geometrical and partly arithmetical will generally admit of an easy solution. Some series can be referred to other series, involving sums of the powers of the natural numbers, special methods being used for these. Many series can be reduced to the form of a binomial expression and so summed at once; others can be formed which yield exponential or logarithmic series after judicious treatment. There are other series of more general forms which need special treatment, and it may be said that the difficulty of summing any series lies chiefly in determining the best method to use rather than in applying the method when found.

Seringsapatam (that is, "Vishnu's city"), once the capital of the native state of Mysore,

Southern India, on an island of the same name in the Kaveri, 10 miles N.E. of Mysore. The name is derived from Sri Ranga, one of the forms of the god Vishnu, to whom there is a temple here. Local tradition says that Gautama Buddha worshipped at this shrine. The fortress was erected in 1454, but was practically rebuilt by Tippoo Sahib, who was thrice besieged by the British. In 1791 Lord Cornwallis was obliged to retire for want of supplies; in 1792 he was victorious in battle, whereupon Tippoo made terms, and in 1799 the fort was stormed by General Harris and Tippoo himself was slain. After the Rajah removed his headquarters to Mysore (1800) the place fell into decay, a process that was accelerated by

the destruction of an Indian shrine. Instead of the nucleus being the finest part of the structure, it is the meanest, whilst the total effect has been marred by absence of a general design. "If its principle of design could be reversed," he declares, "Srirangam, which is certainly the largest, would be the finest temple in the South of India." The enclosure next to the original shrine contains the hall of 1,000 columns (really 960), an instance of misapplied ingenuity and misspent labour, since the hall being low-pitched and the pillars (each a single block of granite, elaborately carved) not more than ten feet apart from centre to centre, the *coup d'œil* is the reverse of striking and magnificent. Seringham was the residence of the Hindu



GREAT PAGODA OF SERINGHAM.

the malaria which infests the district. The natives ascribe the deadliness of the climate to the destruction of the sweet flag, which had extraordinary virtues as a febrifuge. The island measures three miles from east to west and one mile in breadth. The fort stands at the west end, commanding the river; and at the east end is the Lal Bagh, or Red Garden, containing the Mausoleum built by Tippoo for his father, Hyder Ali, and where he, too, lies. Both tombs are maintained by Government. Rice and sugar-cane are grown on the island. In Tippoo's time the population numbered 150,000. It is estimated now at 12,000.

Seringham, or **SRIRANGAM**, a town of the Presidency of Madras, India, on an island of the same name, formed by a forking of the Kaveri, 2 miles N. of Trichinopoly. It is famous for its immense temple to Vishnu, town and temple being virtually coterminous, since most of the houses have been built within the temple walls. James Fergusson takes it as the outstanding example of a misfit in the archi-

reformer Ramamija, who worked out here the system of Vishnuism, which he preached throughout Southern India. He flourished in the first half of the 11th century. Pop. (estimated), 23,000.

Serous Membrane. The membrane which forms the lining wall of the various serous sacs which are met with in different parts of the body. These serous sacs are the pericardium, the pleura, the peritoneum, and the serous sacs which envelop the testes.

Serpent, a powerful bass musical wind-instrument, now almost obsolete. It consists of a wooden tube about 8 ft. in length, gradually increasing in diameter from the mouth-piece to the open end, and twisted so as to resemble a serpent. It is covered with leather, and has a mouth-piece resembling that of a horn or trombone. It was invented in 1590 by Edmé Guillaume, a canon of Auxerre in France.



SERPENT.

Serpentine, a hydrous silicate of magnesia and iron, $3(\text{MgFe})\text{O} \cdot 2\text{SiO}_2 \cdot 2\text{H}_2\text{O}$, of a dull green, reddish or brownish colour, sometimes with spots resembling the skin of a serpent, with specific gravity 2.5 to 2.7, and hardness 3 to 4. It occurs as an alteration-product in olivine, or, less frequently, hornblende and augite; and, as the serpentisation of these minerals proceeds along their cleavage planes, it presents distinctive structures—that from olivine being irregularly-meshed; that from augite, rectangularly-netted or bladed, and that from hornblende, latticed, with blades intersecting at angles of 124° . Serpentine, or massive serpentine occurring as a rock, is dull green and red, mottled and veined with fibrous chrysotile and white steatite, and is easily scratched with a knife. Many serpentinites occur in dykes and veins, and are undoubtedly formed from the hydration of olivine-basalts (peridotites), and others from diabase, gabbro, or hornblende rocks. Serpentine also occurs, however, disseminated through limestones forming opicalcites, which have been supposed to be altered dolomites, or marine deposits, but are probably neither. Serpentine occurs at the Lizard in Cornwall, in Anglesea, Aberdeenshire, and Connemara, and is used for ornamental purposes. Serpentine is not adapted for purposes of exterior decoration, since it is apt to lose its polish on exposure to weather and eventually to disintegrate.

Serpents. [SNAKES.]

Serpent Worship, or **OPHIOLATRY**, is one of the most widespread of all the religions of the ancient world, a fact the more singular having regard to the repulsive nature of the reptile deified. Throughout all the mythologies of the East, in Italy, Greece, Mexico, Peru, the United States and in Northern Europe, whether it be in mysterious stones or alignments, temples or earthworks, in one place intricate, in another crude, symbols of the serpent are ever to be found. Moreover, it is remarkable that whether it be in southern climes and torrid zones where this reptile, through its strength or venom, is an object of terror, or in the northern countries and colder latitudes where its power for harm is infinitely smaller, the snake has been alike regarded with superstitious fear and reverence, as well as with repulsion. But it must be borne in mind that all its associations are not those calculated to raise antipathy. Thus there was a holy snake belonging to Minerva, goddess of Wisdom, which lived within the Acropolis at Athens, a city dedicated to its mistress. Then, again, the serpent depicted as wreathed round the rod of Æsculapius, god of the healing art, was an emblem of the wisdom and foresight essential to physicians. On an island in the Tiber, where a hospital now stands, the Romans raised a temple to Æsculapius, in memory of his having appeared there in the form of a serpent amongst the reeds when he delivered

the city from a pestilence, and snakes were fed and held in honour in his temples throughout both Italy and Greece. According to Eusebius, the celestial and terrestrial systems of our world were, in the theology of Zoroaster, symbolised by the figure of a snake. Throughout the world the serpent has been put forth as a type of all the greater elements of spiritual and earthly life, representing wisdom, strength, and also the principles of good and evil, as well as reproduction. The yearly casting of its skin may possibly have gone far to strengthen the association of the serpent with this last, which attained special prominence in India, and, indeed, forms a subject of special separate study. In addition we constantly find the Pagan world depicting the snake with its tail in its mouth as an emblem of eternity. According to a Rabbinical tradition, Lilith, the first wife of Adam, whom he had repudiated, assumed the form of a serpent as the most beautiful and alluring of creatures, in order the more successfully to bring misery and death upon her rival Eve and the latter's descendants. But, on the other hand, when we turn to the traditions of hell as we find them throughout the religions of the world and note the terrible part that serpents play in the tortures of the lost, when we consider the evil reptiles which figure so conspicuously in the mythologies of the peoples of such diverse countries as India, Persia, Scandinavia, and Mexico, it is clear that the serpent, as a venomous, death-dealing reptile, has been more generally worshipped as an emblem of the terrible and repulsive than as the symbol of life and learning which has been referred to. The worship of the snake appears to have had its rise amongst the people of Chaldæa, who erected the city called Opis and later Antiochia, on the Tigris, where they appear to have practised their religion to a considerable extent. Thence, in course of time, the cult entered Egypt, where the snake was received with homage under the name or title of Canoph or Kneph, the god who was depicted as a serpent holding an egg in his mouth, and known to his priests as the "Architect of the Universe." Canoph appears to have been identical with Ob, Basilicus, or the Regal Snake, and his worship obtained to an extent deemed extraordinary, even amongst contemporary nations conspicuous for their idolatry, figuring as it did in the ritual of almost every Egyptian god, and specially in that of Isie. According to another tradition Thoth, or Taut, was its originator, teaching the settlers in Egypt a theology having as the divine spirit the god Kneph already referred to. This deity, symbolised by a serpent, he described as "the original eternal spirit pervading all creation." Thoth, the Egyptian Mercury, was represented leaning on a staff entwined by a snake in manner similar to the Roman Mercury, or Greek Hermes, whose emblem was the caduceus, a rod round one end of which two serpents were coiled. Bracelets in the form

of serpents were so popular amongst the women of Greece in the time of Clemens Alexandrinus (A.D. 206) as to evoke from him a stern rebuke at their wearing the chief symbol of the devil. A very early history of serpent worship is attributed by Eusebius to Sanchuniathon, a certain ancient Phœnician writer, said to have flourished a few years before the Trojan war. In this, the snake is referred to as Ophion, and its worshippers as Ophionidæ, the title of the book being *Ethothion* or *Ethothia*. In connection with this it is of interest to note that the ancient worshippers of the serpent were also termed Ophitæ, whence it is held by some the Ethiopian derive their name, their colour being merely a coincidence, which ultimately led people in the past to apply the title of Ethiopia to all countries inhabited by a dark-skinned race. From these names, and others similar, such as Ophis, Ophionia, Ophiodes, etc., which we find applied to various colonies and towns of antiquity, it is easy to trace where the worshippers of the serpent settled and spread their belief, in the civilised world of Greece and Rome. Herodotus refers to two small serpents held sacred to Jupiter, in the famous temple of the god at Thebes, whilst the Serpent Column from Delphi, which is to be seen in Constantinople at the present time, testifies to the importance of the symbol in the temple of the Pythian Oracle. The serpents forming this column now are lacking heads as well as tails. The absence of two of the former is ascribed to the Patriarch John VII. in the 9th century. It is said that he secretly broke them off at midnight under the belief that the column was possessed by an evil spirit. Thereupon, the chronicle continues, Constantinople was visited by a plague of serpents due to the desecration of this Delphic relic, and the patriarch was in consequence compelled to restore the heads in order to appease the anger of the people and the offended god of the oracle. The third head was struck off by the Sultan Mohammed II. as an expression of his abhorrence of idolatry when he learnt that the column was still an object of superstitious reverence even amongst the Christians of the city. In considering the subject in America the Aztec mythology especially demands attention. Here we find one of the chief deities, Tonacatl, and his wife, Cihwacohuatl, distinctly referred to as the male serpent and the female serpent, which no doubt explains why the symbol of the snake is so prominent in the carvings and on the frescoes of the temples dedicated to this religion possessing rites exceptionally grim and horrible when the god was worshipped in his capacity of destroyer. In connection with this it is of interest to note the parallel with Siva, the destroyer, to whom the most sanguinary sacrifices in the whole of India's ritual were made, whilst corresponding to the Mexican deity typified by the female serpent may be adduced Kali, the war goddess of India, girded about with snakes receiving the homage of those who

deluged her temples with gore on important occasions. In India divine honours are still paid to snakes as in the past, and, indeed, they play an important part throughout the Hindu pantheon. According to one legend the serpents in their desire to lick up the drops of a divine beverage spilt by the god Garuda, so lacerated their tongues on the sharp-pointed grass that they became permanently forked. With this misfortune, however, there came to the snakes the compensating gift of eternal life from such of the nectar (amrita) as they had swallowed. The god Garuda, the messenger and instrument of Vishnu, in form half man half bird, figures conspicuously as the destroyer of snakes, being placed as guard of the path to the Hindu paradise to defend its entrance against all serpents. Turning to the Hebrew race, although we find the snake was generally an object of aversion amongst them, they, nevertheless, clung to the worship of the brazen one (probably that erected by Moses), to which they offered incense habitually, under the name of Nehustan, until it was destroyed by Hezekiah. This, no doubt, was the practice referred to by King Solomon in the Book of Wisdom, wherein he denounces "the foolish devices of their wickedness, wherewith being deceived they worshipped serpents devoid of reason," and had been in use for many generations previously. However, notwithstanding the denunciations of kings and prophets in the Old Testament, we find the disciples in the New Testament exhorted to imitate the sagacity of the snake—"Be ye therefore wise as serpents." The veneration for snakes which obtains at the present time amongst savage races may generally be attributed to Totemism, i.e., the belief that there is an actual living relationship between the savage and the objects of that particular class of things which constitute his "totem." Thus in Senegambia those who hail the scorpion and its kind as their totem, declare no snake will injure them, provided they in turn reverence and respect it, whilst many members of this totem assert they are able to cure by personal contact those who have been bitten by snakes. Here it may be pointed out that Pliny mentions a similar power being possessed by the Ophitæ of the past, who lived in Cyprus, Italy and Africa, and to whom reference has already been made. It must, however, be borne in mind that Totemism is by no means confined to reverence for snakes alone, though probably in this form it was originally most general. Ophiolatry appears to have existed, at least to some extent, in Britain in the earliest times, one of the Druidic titles of honour being, it is said, "Gnadr," or "Serpent," from which possibly "adder" may not unreasonably be considered as derived. Again, the chariot of the goddess Ceridwen was drawn by snakes, whilst it has been held by some that the interesting earthworks and stones at Avebury, in Wiltshire, point to the former existence of a vast temple in honour of the serpent. Be

this as it may, there is no doubt that, from certain bardic references, from the superstitious reverence for snakestones as amulets (most probably the "anguinum" of Pliny), and from devices suggestive of serpents on certain members, the serpent was certainly formerly revered in Britain, though by no means to such an extent as elsewhere.

Serpukhov, a town of the government of Moscow, Russia, on the Nara, near its junction with the Oka, 56 miles S. of Moscow city. Its manufactures include cottons, woollens, paper, leather, furniture, pottery and porcelain, and it is also an important distributing centre. It is one of the oldest towns in Moscow principality and in the 14th and 15th centuries was several times invaded by Tatars. By the 16th century its system of fortification was so complete that it was enabled to withstand an invasion of the Mongols on the grand scale. Pop. (estimated), 28,000.

Serpula, a genus of marine worms belonging to the class Chaetopoda, the sub-class Polychæta, and the order Tubicolæ. It lives in a strong calcareous tube attached to shells, rocks, etc. This may be straight, sinuous, or tortuous. There are eight living British species.

Serrano y Dominguez, FRANCISCO, DUKE DE LA TORRE, marshal and statesman, was born at Leon, Cadiz, Spain, on December 17th, 1810, and was educated at Vergara. He entered the army and saw much service during the battles of the first Carlist rebellion. In 1839 he was elected to the Cortes for Malaga and thenceforth became one of the leading actors in the political intrigues and insurrectionary movements of Queen Isabella's reign, holding twice the portfolio of war before he withdrew for a period to his estates in Andalusia. Shortly after his return to the political arena he was made marshal (1856) and from 1859 to 1862 acted, not without success, as Captain-General of Cuba, being created Duke de la Torre on his return to Spain. He received the Order of the Golden Fleece in 1866, and in 1868 joined the conspiracy which led to the overthrow of the Bourbon dynasty. Then he was placed at the head of the Provisional Government, and received the title of Regent (1869). On the accession of Amadeus (1870) he became commander-in-chief, and during the following years gained several successes against the Carlists. He withdrew from Spain on the proclamation of Alfonso XII., but returned to Madrid in 1876 and took his seat in the Senate as a marshal. He died in Madrid on November 26th, 1885.

Sertorius, QUINTUS, the celebrated Roman statesman and general, was born at the Sabine village of Nursia, in the Apennines. He served under Marius in the victory over the Teutones at Aquæ Sextiæ (102 B.C.), and joined that statesman as leader of the democratic party against Sulla (88), although he disapproved of his personal character. He was not responsible

for the carnage wrought by Marius and Cinna in 87, but showed his desire to check it by putting to death several hundred blood-stained slaves. On the return of Sulla from the East in 83, he withdrew to Spain, where he maintained the Marian cause in a desultory but vigorous fashion, taking part in the Mediterranean expeditions of the Cilician pirates and conducting a successful campaign in Mauritania. It was his aim to establish a strong government in Spain and to introduce the Roman type of civilisation among the natives, and by his statesmanlike and equitable rule he won the confidence both of the Spaniards proper and of their westerly neighbours, the Lusitani. He was assassinated at a banquet in 72, through the instrumentality of his subordinate and rival Perperna. He had a happy knack of conciliating ruder peoples, and his popularity is thought to have been promoted by his making a pet and companion of a white fawn, which accompanied him on his walks and attended him on all occasions.

Sertularians. [SEA-FIR.]

Serum. [BLOOD.]

Serval (*Felis serval*), the Bush-cat of the Dutch colonists at the Cape, is found throughout the greater part of Africa, especially in the southern half of the continent, but extending as far north as Algeria. It affects grassy plains and uplands where antelopes and other game, upon which it preys, abound. Its legs are much longer and the tail is much shorter proportionally than in most of the true Cats. It measures forty inches in length and the tail about sixteen inches. The ground-colour of the skin is tawny, sometimes lighter, sometimes darker, and spotted with black. On the flanks the spots are elongated lengthwise, and, along the back, merge into distinct bands continued on to the forehead. This running together of spots into longitudinal stripes is characteristic of many of the Cats. The tail is ringed with black. The fur, though coarse, is handsome, and has a commercial value.

Servetus, MICHAEL, or MIGUEL SERVETO, physician, savant and theologian, was born at Tudela in Navarre in 1511. After studying at Saragossa and Toulouse, he travelled in Italy and in Germany, where he became acquainted with the Reformers. From 1535 onwards he lived chiefly in France. He succeeded the famous anatomist Vesalius, and is said to have been extremely skilful in dissection and had an unrivalled knowledge of Galen. He also studied geometry, astrology, theology and Hebrew. He practised medicine from time to time and seems always to have had a taste for theological speculation. The Socinian tendencies of his *De Trinitatis Erroribus* (1531) excited the animosity both of Catholic and Protestant divines, and his unfortunate efforts to maintain a friendly correspondence with John Calvin resulted in his ruin; for it was probably through the latter's instigation that he

was seized at Lyons in 1553 (ostensibly for the heretical opinions avowed in his *Christianismi restitutio*, published in that year). He escaped from prison, but, four months later,

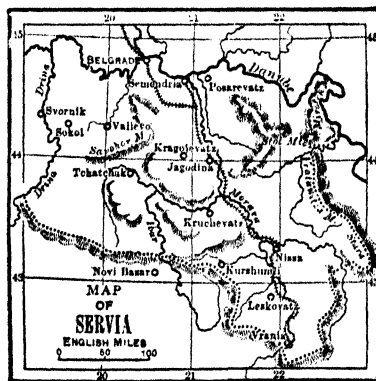


MICHAEL SERVETUS.

was captured whilst passing through Geneva, and, after a trial of two months, condemned and burnt at the stake at Champel, a suburb of the city, on October 27th, 1553. This execution throws a lurid light on the fanaticism of which some of the Reformers were capable. Servetus is stated to have discovered the pulmonary circulation of the blood.

Serbia, a kingdom in the Balkan Peninsula, bounded on the N. by Slavonia and Hungary, on the E. by Rumania and Bulgaria, on the S. by Turkey and on the W. by Bosnia. On the north the Save and Danube, on the north-east the Danube and on the west the Drina are natural boundaries. The country occupies an area of 18,630 square miles. The surface is for the most part mountainous, the highest elevation being Mt. Kopanik in the south (7,000 feet). Woods clothe the hillsides, and the valleys and low grounds besides the rivers Morava, Nissava, Drina, Save and Danube furnish excellent pastures, and yield crops of maize, wheat, barley, oats, flax, hemp and tobacco. Fruit is abundant, the national drink *slivovitz* being distilled from plums. Horses, cattle, sheep, swine and goats are raised in great numbers, and bee-keeping is a general custom. Iron is profitably worked at Maidanpek; gold, silver, copper, lead, sulphur, zinc, arsenic and antimony, coal and lignite are met with, but the mineral wealth remains comparatively unexplored. The climate is warm in summer, but very severe in winter on the uplands. Manufacturing industries are yet in their infancy and comprise flour-milling, brewing, sugar-making, weaving, tanning, pottery, bootmaking and iron-working. Belgrade (69,769) is the capital, other towns being

Nisch (24,573), Kraguyevatz (15,586), Leskovatz (13,641), Pozarevatz (12,980), and Shabatz (11,084). The Government is a constitutional monarchy, assisted by a council of eight ministers, responsible to the nation. The legislative authority is the National Assembly, or Skupshchina, of 130 deputies elected on what is practically manhood suffrage. The State religion is the Greek Orthodox, but there is unrestricted freedom of conscience. Elementary education is free and compulsory. Serbia first appears as a distinct principality in the middle of the 12th century. Two hundred years later it was conquered by Turkey, and never recovered freedom until the revolt under Kara-George in 1801. A troublous period ensued, and in 1829 the Porte recognised Alexander Milosch (I.) Obrenovitch as hereditary prince, but the country was the scene of perpetual disorders. In 1868 Michael Obrenovitch was murdered by the opposite faction, and was succeeded by his cousin Milan, who was proclaimed king in 1882, having previously married Natalie Keschko, a Russian lady. An ill-advised war with Bulgaria might have ended in utter disaster, which was averted by a treaty in 1886. The Austrian sympathies of the king and the Russian proclivities of the queen led to a divorce in 1888, but next year Milan was compelled to abdicate in favour of his son Alexander, a boy of fourteen. A triumvirate of Regents was instituted, but in 1893 the young king suddenly declared himself of age and displaced the Regents, who were supporting the Government of a minority. Soon afterwards Milan was allowed to return, a reconciliation being effected with Queen Natalie. In 1900 Alexander married a lady very considerably



SKETCH MAP OF SERBIA.

his senior and alienated the sympathies of both his parents. In 1901 Milan died. On July 11th, 1903, a revolution took place, and both Alexander and Queen Draga were murdered, and Prince Karageorgevitch was elected king. He was crowned as King Peter in 1904. Relations

with the United Kingdom, interrupted by the assassination, were resumed in June, 1906, after the compulsory retirement of the regicides and a pledge that they would not be reinstated. Pop. (1900), 2,492,882. [SEZESS.]

Service-Tree, a tree, *Pyrus (Sorbus) domestica*, belonging to the same genus of the Rosaceæ as the apple, pear, and rowan. It grows from 20 to 60 feet high, and is wild in France and Italy, but doubtfully so in England. It lives to a great age, producing a hard, heavy, fine-grained wood, susceptible of a high polish, much in request in France for cogs, screws, rulers, etc., and suitable for coarse engraving. Its leaves are imparipinnate and serrate; its cream-coloured flowers small; and its fruits less than an inch across, either apple-shaped or pear-shaped, greenish-brown with rusty specks, and austere, requiring bletting like those of the medlar. The allied British species (*P. torminalis*) is known as the Wild Service.

Sesame (*Sesamum indicum*), an Indian herb belonging to the order Pedaliaceæ, allied to the Labiata, the numerous seeds of which yield 40 to 44 per cent. of a tasteless, straw-coloured fixed oil, known as gingelly oil, the seeds themselves being known also as til seed. It is the oil of India, and is used instead of, or as an adulterant of, olive oil, or, when of a very good quality, of oil of almonds. It is itself adulterated with ground-nut oil. The plant is now cultivated in southern Europe, and the seeds are largely used in soap-making, being chiefly crushed at Trieste and Marseilles. The seed contains 76 per cent. of olein, together with stearic, palmitic, and myristic acids; but the oil is apt to become rancid. In India it is used in cooking, for lamps, and as an unguent. In large doses the oil is laxative and, when macerated, the leaves yield a mucilaginous preparation employed occasionally in dysentery and cholera infantum. "Open Sesame" was the charm at the utterance of which the door of the robbers' cave in the *Arabian Nights'* story of "Ali Baba and the Forty Thieves" flew open.

Sesamoid Bone, a small mass of bone, developed in the substance of a tendon; the patella, or knee cap, is an example of a sesamoid bone.

Sesostris, a semi-mythical king of Egypt, who according to Herodotus and other Greek historians, extended his rule over the whole known world. The legends concerning him are supposed to have been based on the achievements of Rameses II. and several other monarchs.

Session, COURT OF. In England sessions of the Peace are sittings of the magistrates or justices of the peace for the exercise of their jurisdiction. They are of three kinds: petty, special, quarter or general sessions. (1) Petty Sessions is an occasional meeting of two or more justices for the transaction of business in which more than one justice is required. (2)

Special Sessions is a meeting of two or more justices held for a special purpose, such as the licensing of an alehouse, etc. (3) Quarter or General Sessions is a Court of Record held every quarter for execution of the authority conferred on the justices by their Commission. Formerly they had jurisdiction to try cases of treason, murder, manslaughter, etc., but in 1868 many of their functions were transferred to the County Councils, and their jurisdiction is now restricted to comparatively petty offences. In Scotland the supreme court in civil causes is called the Court of Session. It was established in 1532 on the model of the Parlement of Paris (modified after the Union) and sits in Edinburgh. It consists of an Inner House, in two Divisions, each with four judges, and an Outer House of five judges, the Court comprising thirteen judges in all. The First Division of the Inner House is presided over by the Lord President, and the Second by the Lord Justice Clerk, the judges of the Outer House being called Lords Ordinary. Appeals may be made from the Lords Ordinary to either Division of the Inner House, or to all the judges of the Court of Session; and an appeal from the Court of Session to the House of Lords.

Sestertius (literally, "that which contains two and a half," from *semis* (= semi), "half," and *tertius*, "third"), a Roman coin, which originally contained 2½ asses, being a quarter of the denarius, which contained 10 asses. When the denarius was made equivalent in value to 16 asses, that of the sestertius became 4 asses. The sestertius was worth about 2d. of English money. The sestertium, a money of account, was equal to a thousand sestertii.

Set, or SETESH, the god of the prehistoric inhabitants of Egypt before the coming in of Horus, the hawk-god. He was the god of the Asiatic invaders who broke in upon the primitive civilisation of the Osiris worshippers of the Delta and Upper Egypt. "He is always shown," according to Professor Flinders Petrie in *The Religion of Ancient Egypt*, "with the head of a fabulous animal, having upright square ears and a long nose. When in entirely animal form he has a long upright tail. The dog-like animal is the earliest type, as in the second dynasty; but later the human form with animal head prevailed." Occasionally the crocodile was identified with him and, much more rarely the



SET.

hippopotamus was his emblem. His worship experienced singular vicissitudes. At one period he was the great god of all Egypt, but his worshippers were gradually ousted by the tribes who worshipped Horus. Then Set appears in the second dynasty, the last king of which, says Flinders Petrie, "united the worship of Set and Horus. In the early formulæ for the dead he is honoured equally with Horus. After suppression he appears in favour in the early eighteenth dynasty; and even gave the name of Sety I. and II. of the nineteenth dynasty."

Seton, a piece of foreign material, such as a skein of silk or a gutta-percha tube, threaded through the skin, or inserted into a sinus, with a view to setting up counter-irritation, or promoting suppuration. This method is practically obsolete.

Setter, a breed of sporting dogs that formerly marked game by "setting" or crouching down. This was at the time when birds were netted. Since the introduction of firearms setters have been broken to mark like the pointer. Spaniels were originally used as setters, and the English breed probably sprang from a cross between the spaniel and the pointer. Youatt, however, says the setter is the large spaniel, "improved to his peculiar size and beauty, and taught another way of marking game." In a document, dated 1685, a yeoman binds himself, for a consideration, "fully and effectually to teach a spaniel to sit partridges and pheasants." Dudley, Duke of Northumberland, is supposed to have been the first systematically to break-in sitting dogs (1335). The English setter is generally white, marked with red or ticked with black; but there is great diversity in the coloration. The coat should be soft and wavy, the limbs thinly and the tail deeply fringed, and there should be a good growth of hair between the toes. The Gordon setter is derived from the English setter crossed with a collie bitch, broken to set, and is black and tan, with a head somewhat like that of a bloodhound. The Irish setter, of unknown origin, is less stoutly built, and generally red. Dr. John Kaye, or Caius, physician to Edward VI., Mary and Elizabeth, wrote a brief treatise in Latin on English dogs about 1550. This was translated into English in 1576 by Abraham Fleming. Caius' description of the action of the "setting-dogge" is vivid and lifelike:—"When he hath found the byrde, he keepeth sure and fast silence, he stayeth his steppes and wil proceede no further, and with a close, covert, watching eye, layeth his belly to the grounde, and so creepeth forward like a worme. When he approacheth neere to the place where the byrde is, he lays him downe, and with a marcke of his pawes, betrayeth the place of the byrdes last abode, whereby it is supposed that this kinde of dogge is called *index*, setter, being indeede a name most consonant and agreeable to his quality."

Settle, a town of the West Riding of Yorkshire, England, on the left bank of the Ribble, 14 miles N.W. of Skipton. It is attractively situated near the base of a precipitous limestone hill, called the Castleberg, because, seen from a distance, its features present some resemblance to an ancient castle. The principal structures are the church of the Holy Ascension in the Early English style, the Public Buildings in the Elizabethan, the Institute, the Victoria Hall, and the Craven Assembly Rooms. The town is an ideal centre for a hill-climbing holiday, Penygent (2,273 feet high), seven miles to the north, being quite practicable. Dr. George Birkbeck, the promoter of mechanics' institutes, was born at Settle in 1776. Pop. (1901), 2,302.

Settle, ELKANAH, dramatist and poet, was born at Dunstable, Bedfordshire, England, on February 1st, 1648, and studied at Trinity College, Oxford. Proceeding to London, he began to write for the stage, and produced two tragedies, *Cambyzes* (1666) and *The Empress of Morocco* (1671), which were fairly successful. He was pitted against Dryden by the latter's enemies and "Glorious John" retaliated by pillorying Settle as "Doeg" in *Abalom and Achitophel* (1682). Settle's industry, however, had not relaxed and he wrote other plays, which were duly acted and dedicated to distinguished members of the nobility. Amongst these productions were *Love and Revenge* (1675), *Conquest of China by the Tartars* (1676), *Ibrahim, the Illustrious Bassa* (1676), *Fatal Love* (1680), and, pandering to the Protestant fury of the hour, *The Female Prelate, being the History of the Life and Death of Pope Joan* (1680). He was even base enough to write "A Panegyrick on Sir George Jefferies" (1683), and a "heroick poem" on the Coronation of James II. (1685). At the Revolution he prepared to recant and, in 1691, was appointed City Laureate. His abilities were on the level of the Common Council and quite equal to hymn the pageant of the Lord Mayor's Show, of which he sang the praises in successive years. He had not abandoned playwriting, however, and produced the *Heir of Morocco* in 1682, *Distressed Innocence* in 1691, and several more, the last being *The Ladies' Triumph* (1718). He had fallen pretty low when he composed songs for Bartholomew's Fair, love-letters for maid-servants and ballads for street hawkers. His fortunes were at their darkest in 1718, in which year his friends procured him admittance into the Charterhouse, London, where he died on February 12th, 1724. He had a good working knowledge of stagecraft and was occasionally adept at handling plots, but he only lives now in Dryden's satire.

Setubal, or ST. UBES, a seaport of the province of Estremadura, Portugal, 20 miles S.E. of Lisbon. It is commanded on the west by the barren range of Arrabida, 1,700 feet high, a cloister with a stalactite cavern, the scene of numerous pilgrimages. The ruins of Troia

have disclosed some beautiful Roman remains, including a house. The town suffered severely in the famous earthquake of 1755. The export trade is important, since it includes a fine quality of salt especially suited for the curing of meat and fish, the best oranges in Portugal and Muscatel grapes of delicate flavour. The industries comprise the fisheries, ship-building, lace-making, sardine-curing and the making of fish guano. Manoel du Bocage (1766-1806), the modern national poet, was a native of Setubal. Pop. (1900), 21,819.

Seven. A mystical significance was attached to this number by the Hebrews, Egyptians, Persians, Greeks, and other ancient races. Its sacred character was probably due to the seven planets and the weekly changes of the moon. In the Old Testament it figures conspicuously not only in the religious observances of the Jews, but in the record of actual historical events. It occurs frequently with a symbolic force in the imagery of the Apocalypse. Various multiples of seven are also used in the same manner. In ancient Greece the number was associated with Apollo and with Dionysus, the region in which its magic properties were most fully recognised being the island of Eubœa. Such mediæval notions as the Seven Deadly Sins doubtless originated in similar ideas

Seven Bishops, THE. The small company of prelates who in May, 1688, drew up a petition at Lambeth, urging James II. not to enforce his order that the clergy should read his Declaration of Indulgence at divine service on May 20th and the following Sunday. They were summoned before the King in Council and then committed to the Tower amidst a scene of unparalleled excitement. They were brought before the Court of King's Bench on June 15th on the charge of uttering a seditious libel and committed for trial. The further proceedings began in Westminster Hall on the 29th of June. At ten o'clock on the following morning the jury returned a verdict of "Not Guilty," to the great joy of the people and the discomfiture of the Court and its creatures. The bishops were Sancroft of Canterbury, Ken of Bath and Wells, White of Peterborough, Lloyd of St. Asaph, Trelawney of Bristol, Lake of Chichester, and Turner of Ely.

Sevenoaks, a town in Kent, England, 21 miles S.E. of London, picturesquely situated in finely-wooded country. The principal structures are the church of St. Nicholas, a fine example of the Perpendicular style in Kentish rag, dating from the 13th to the 15th century and containing numerous interesting monuments to county celebrities; the Grammar School, where George Grote was educated,

founded in 1432 by Sir William Sevenoke, Lord Mayor of London in 1418, and endowed with a charter by Elizabeth in 1560; the Boswell School, founded by Lady Margaret, wife of Sir William Boswell, Charles I.'s Ambassador at The Hague; the Walthamstow Hall for the daughters of missionaries, and several almshouses and hospitals. Near Sevenoaks, in 1450, Sir Humphrey Stafford in vain endeavoured to effect a compromise with the



Photo]

KNOLE HOUSE, SEVENOAKS.

[Chester Vaughan.

rebels under Jack Cade, in whose trial he afterwards took part. Half a mile south-east of the town is the fine old English mansion of Knole standing in a beautiful park of 1,000 acres. From 1450, when it was purchased from Lord Saye and Sele by Archbishop Bourchier, to the time of Archbishop Cranmer, who ceded it to Henry VIII., it was the property of the see of Canterbury. Elizabeth gave it first to the Earl of Leicester and afterwards to Thomas Sackville, Earl of Dorset, by whom it was reconstructed, furnished and decorated in much the same style that still exists. It is the seat of Lord Sackville. Three and a half miles to the north-west is Chevening Place, designed by Inigo Jones, the seat of the Earl of Stanhope, and five miles to the north-west is the lofty knoll (770 feet) crowned by a clump of beeches, known as Knockholt Beeches, from which St. Paul's Cathedral is visible. About six miles to the north-east of Sevenoaks is Ightham Mote, one of the most perfect examples of a moated mansion in England. Pop. Sevenoaks (1901), 8,106.

Seven Sleepers of Ephesus, THE. form the subject of an ancient Syrian legend, the earliest mention of which in the West occurs in the 6th century in the writings of Gregory of Tours. The story is that during the Decian persecution seven Christian youths took refuge in a cave in the vicinity of Ephesus, and were there imprisoned by their pursuers, who rolled huge stones against the mouth. By the Divine favour they fell into a deep sleep, from which

they were accidentally awakened by the movements of a shepherd after the lapse of nearly 200 years. One of the youths was sent to buy food, and as he drew near the town he wondered at seeing the Cross erected over the gate and churches. Offering a coin of Decius in exchange for bread, he was arrested on the suspicion that he had discovered hidden treasure. A visit to the cave, however, convinced the citizens of the truth of his story. The sleepers were visited by the Emperor Theodosius, who learnt from them that the miracle had been wrought to confirm his faith in the Resurrection. Thereupon the seven again sank into a calm sleep, from which they will not awake till the Last Day.

Seven Wise Men, the name given to those Greek sages who, before Socrates had laid the foundations of moral philosophy, expressed the highest wisdom of the time in a number of pithy aphorisms. Their names were Solon of Athens, Thales of Miletus, Pittacus of Mitylene, Bias of Priene, Chilon of Sparta (author of the famous maxim "Know thyself"), Cleobulus, Tyrant of Lindus in Rhodes, and Periander, Tyrant of Corinth.

Seven Wonders of the World, THE, a name applied, after the time of Alexander the Great, to the seven most splendid monuments of the ancient world, which were the Pyramids of Egypt, the Hanging Gardens of Babylon, the temple of Diana at Ephesus, the statue of the Olympian Zeus at Athens, the Mausoleum at Halicarnassus, the Colossus of Rhodes, and the Pharos (or Lighthouse) of Alexandria.

Seven Years' War, THE (1756-63), was due to the alarm occasioned in Europe by the ag-



FREDERICK THE GREAT.

(Engraved by R. Taylor.)

gressive designs of Frederick II. (the Great) of Prussia and the desire of the Empress Maria Theresa to recover Silesia from that monarch.

Louis XV. of France, the Tsarina Elizabeth, and Augustus, King of Poland, who was also Elector of Saxony, ranged themselves on the



MARIA THERESA.

side of Austria, whilst Great Britain, already at war with France in the colonies, aided Frederick with money, placed an army in Hanover at his disposal, and promised him further assistance. In his first campaign Frederick overran Saxony, defeated the Austrians (who were marching to its relief under Marshal Browne) at Lobositz, and forced the Saxon army to surrender. In 1757 Frederick invaded Bohemia and invested the Austrian army in Prague, but received a crushing defeat at the hands of Marshal Daun (June 18). Five weeks later the Duke of Cumberland, in Hanover, was defeated at Hastenbeck by Marshal d'Estrées, and agreed by the Convention of Kloster-Zeven to disband nearly the whole of his army; but at Rossbach Frederick was successful against an army composed of Imperialists and French troops under Soubise, and Silesia, which had meanwhile been seized by the Austrians, was reoccupied after his victory at Leuthen (December 5). These successes were followed by the withdrawal of the Russians from East Prussia. In 1758 the fortune of Frederick varied considerably. His inroad into Bohemia was cut short by a Russian invasion, and, although he was successful against these foes at Zorndorf, he was surprised and severely defeated by Marshal Daun at Hochkirch; yet, before the year closed, the Prussians had regained Saxony and Silesia. Frederick's fourth campaign (1759) was a series of disasters. He himself suffered a terrible reverse at Kunersdorf, and the surrender of Finck to Daun was followed by the Austrian occupation of Saxony. Against the ill-fortune of Prussia was to be set the almost unvarying success of Ferdinand of Brunswick in Hanover

and Westphalia. He had been placed at the head of a new army by the British Government, who refused to recognise the Convention of Kloster-Zeven, and by his victory at Minden (August 1, 1759) finally drove the French behind the Rhine. British aid and his own indomitable energy enabled Frederick to resume the struggle in 1760, notwithstanding his impoverished condition. In spite of his success at Liegnitz (August 15), Berlin was captured by the allies in October, but the fierce battle of Torgau (November 3) drove the enemy from Silesia and saved Prussia from destruction. During the next year the war was carried on in a desultory fashion, owing to the exhaustion of both sides, Frederick's position being rendered more difficult by the withdrawal of the British subsidy after the death of George II. But in 1762 he pursued the struggle so vigorously—aided by his brother Prince Henry and in the west by the Duke of Brunswick—that the French withdrew from the conflict, entering into treaties with Great Britain and Prussia, which culminated in the Peace of Paris (February 10th, 1763). Maria Theresa, left to carry on the war alone, found herself forced to conclude the Peace of Hubertsburg (February 15th, 1763), in which she abandoned her claim to Silesia. The main result of the war, so far as Great Britain was concerned, was an immense accession to her dominion and power not only in India but also in North America.

Severalty. A person is said to hold property in severalty when he is the sole tenant thereof, and holds them in his own right only, without any other person being joined or connected with him in point of interest during his estate therein.

Severn, THE (by the Britons called Hafren and the Romans Sabrina, next to the Thames the largest river in England. It rises at Maes Hafren, on the northern slope of Plinlimmon, and flows in a semicircular course of 210 miles past Llanidloes, Newtown, Welshpool, Shrewsbury, Bridgnorth, Bewdley, Worcester, Tewkesbury, and Gloucester, till it opens out into the Bristol Channel. Its length in a direct line from its source to the sea is 80 miles. Its basin extends over 6,000 square miles, the chief tributaries being, on the right, the Vyrnwy, the Stour, and the two Avons, and, on the left, the Teme and the Wye. Owing to the gradual decrease in the width and depth of the Bristol Channel the tide rushes up with great force, at times creating a bore five feet high, which has occasionally caused very serious destruction. Canals connect the Severn with the Thames, Trent, Mersey and other rivers. It is a noted salmon stream, and the scenery on its banks is, in certain passages, extremely charming. The Severn Tunnel, connecting Gloucestershire with Monmouthshire, is 4½ miles long, of which 2½ miles are carried beneath the bed of the river. It was begun in 1873 and opened for traffic on New Year's Day, 1886.

Severn, JOSEPH, the friend of Keats, was born at Hoxton, London, on December 7th, 1793. He was early seized with a longing for the artistic career, which at last he was enabled to gratify only after a series of difficulties that would have discouraged most men. Whilst still in the thick of his struggles he formed the friendship of John Keats (1816), to whom for the brief remainder of the poet's life he was more than brother. In 1818 he won the Royal Academy's prize for the best historical painting, his subject being "Una seizing the dagger from the despairing Red Cross Knight." Two years later he accompanied Keats to Rome and stayed with him till his death in 1821. His picture of "The Death of Alcibiades" gained a travelling scholarship of £130 for three years from the Royal Academy. But though he continued to paint industriously for years historical and imaginative subjects and portraits he met with no appreciation from the public, and in fact took no place as an artist. His friendship with Keats, however, had introduced him into good sets both in England and Rome, and, largely owing to the interest of W. E. Gladstone and Baron Bunsen, he became British Consul at Rome in 1860, a post which he held for twelve years. He died in Rome on August 3rd, 1879.

Severus, LUCIUS SEPTIMIUS, the twenty-first Emperor of Rome, was born near Leptis Magna in Africa in A.D. 146. On the assassination of Pertinax, in 193, he was proclaimed Emperor at Carnuntum, the capital of his province Pannonia Superior, the legions in Germany and Illyria joining those under his own command. Didius Julianus offered but a feeble resistance, but he had to contend with more formidable rivals in Pescennius Niger and Clodius Albinus, the last of whom was vanquished in a fierce battle near Lyons in 197. With the disappearance of the two competitors from the scene, the character of Severus altered and he developed a strain of cruelty hitherto unsuspected in his nature. The success of his Parthian campaigns (197-202) added the province of Mesopotamia to the Empire. His last three years were occupied with wars in Britain, and he died at York in February, 211. He was a cold, shrewd, capable man of business, unscrupulous, and, though no general, personally brave and, by attention to discipline, improved the status of the army as a fighting machine.

Severus, MARCUS AURELIUS ALEXANDER, Roman Emperor, was born at Arca near Tripoli in Syria in A.D. 205. He was an accomplished and scholarly youth, and, in 211, was adopted as his successor in the purple by Heliogabalus. His original name had been Alexander Basianus, and when he became Emperor in 218 he was called Alexander Severus. His reign was disturbed by several mutinies in the army, but he was, notwithstanding, able to come out of a war against the Persians with something like success. He celebrated a triumph at Rome in 233 and next year was engaged in

repelling a German invasion of Gaul. In 235 he was murdered during a mutiny which was probably fostered by Maximinus, who succeeded him on the throne.

Sévi^gné, MARIE DE RABUTIN-CHANTAL, MARQUISE DE, the most fascinating of letter-writers, was the daughter of Celse Bénigne de Rabutin, Baron de Chantal, the representative of an ancient Burgundian family, and was born in Paris on February 6th, 1626. She lost her parents in early childhood, and was brought up by her mother's brother, Christophe de Coulanges, Abbé de Livry. In her 19th year she married Henri, Marquis de Sévi^gné, a gentleman of Brittany, to whom, in spite of his debaucheries, she seems to have been sincerely attached. In 1651 he was killed in a duel occasioned by one of his amours, and henceforward she devoted herself to the care of her little son (Charles) and daughter and the cultivation of her numerous friendships. Her time was divided between her husband's country seat of Les Rochers, near Vitre, and the gay world of Paris, with occasional visits to her friends' châteaux after the marriage of her daughter (Françoise Marguerite) in 1669 to François Adhémar, Comte de Grignan, the Lieutenant-General of Provence. Excepting during the intervals when they were together either at Paris or in Provence, mother and daughter kept up a constant correspondence for 25 years, and the letters written by Mme. de Sévi^gné have ever been treasured by lovers of literature, not only for their graceful style, but for the picture they present of a noble, pure, and tender-hearted woman. The whole of Mme. de Sévi^gné's correspondence throws much valuable light on the history and social condition of the time. She died of smallpox at Grignan, in the department of Drôme, on April 18th, 1696.

Seville, a province of Spain, formerly one of the four Moorish kingdoms, is bounded on the N. by Badajoz, on the S. by Malaga and Cadiz, on the E. by Cordova, and on the W. by Huelva and the Atlantic. It occupies an area of 5,428 square miles. Though rugged and barren where broken up by the Sierra Morena in the north, the greater portion consists of a rich plain traversed by the Guadalquivir from north-east to south-west. The principal crops are wheat, rye, oats, barley, maize, olives, grapes and fruit, oil, wine, oranges and olives being exported largely. The rough grounds afford pasture to many sheep and oxen and the mountains yield lead, copper, silver, iron, alum and coal. There are also salt-mines. Among the manufactures are silken, woollen and other textile goods, chocolate, tobacco, leather, flour, oil, soap, pottery and glass, besides iron- and bronze-founding, distilleries, breweries and the State factories of small arms, shells and gunpowder. Important towns are Carmona, Ecija, Osuna, Utrera, Moron de la Frontera, Marchena and Lebrija. Pop. (1900), 555,256.

Seville, the capital of the foregoing province, Spain, on the left bank of the Guadalquivir, 355 miles S.W. of Madrid, and accessible for small vessels from the sea. In Roman times it was a prosperous city. It passed from the Goths to the Arabs in 712, and flourished



THE GIRALDA, SEVILLE.

under them until recovered by Ferdinand III. in 1248. The cathedral (1403-1519) is a fine example of Spanish Pointed Gothic. The Giralda Tower is partially Mauresque, but the noblest monument of Arab rule is the Alcazar, a riverside palace. Other remarkable features of the city are the archiepiscopal palace (1697), the university (1567), the Casa del Ayuntamiento (1545), the palace San Telmo, formerly the seat of a naval college founded by the son of Columbus, bequeathed to the archbishopric by the Duchess of Montpensier, who gave part of the grounds to the municipality, and the vast Plaza de Toros or bull-ring. The Seville School of Painting, the glory of Spain, numbers among its immortals Velazquez and Murillo, both natives of the city. Triana, on the opposite side of the river, is the Gipsy quarter. There are considerable exports of skins, wool, silk and oil, and the manufactures include cannon, small-arms, tobacco, pottery and porcelain, petroleum, woollen goods, silken fabrics, iron, machinery, beer, wine and spirits, soap, corks, chocolates and preserves. Pop. (1901), 148,315.

Sèvres, a town of the department of Seine-et-Oise, France, on the left bank of the Seine, 4 miles E.N.E. of Versailles, midway between

that town and Paris. The Government Porcelain Factory, established in 1766, and rebuilt in 1876, employs many hands, and turns out some of the finest ceramic work in the world. The museum connected therewith contains specimens illustrating the whole history of the art, and there is also a school of mosaic. Pop. (1901), 8,216.

Sèvres, DEUX, a department in the west of France, bounded on the N. by Maine-et-Loire, on the E. by Vienne, on the S.E. by Charente, on the S. by Charente-Inférieure, and on the W. by La Vendée. Its area of 2,337 square miles is divided into three districts—namely, the Gâtine, the Plain and the Marsh. The first, adjoining the Bocage, is rocky and poor; the second yields large crops of grain; whilst the third, the smallest in extent, is fairly fertile where drained. The highest point (892 feet) occurs to the east of Parthenay. The horses and mules of the department are much esteemed, and the cattle, goats, sheep and other live-stock are a source of considerable profit. The principal crops are wheat, oats, potatoes, barley, mangolds, green stuff and vines. The chief trees are oaks, chestnuts, walnuts, beeches and apples. Wine, cider, honey and vegetables are important products. Coal, peat and freestone are worked, and iron, antimony and silver-bearing lead occur. The industries include paper-making, sugar-refining, distilling, and tanning, besides manufactures of textiles, gloves, brushes, hats and flour. Niort (20,738) is the capital. The department was formed in 1790 mainly out of the districts of Thouars, Gâtinais and Niortais, which constituted a portion of the old province of Poitou. Pop. (1901), 342,474.

Seward, ANNA, authoress, "the Swan of Lichfield," was the daughter of the rector of Eyam, in Derbyshire, where she was born in 1747. Her father became a canon of Lichfield when she was seven years old, and she lived in the cathedral city for the rest of her life, dying in it on March 25th, 1809. She wrote a great deal of occasional verse of no real merit. *Louisa* (a metrical romance, 1782), the *Life of Dr. Darwin* (1804), and her other works have long been forgotten, but she is remembered as the friend of Sir Walter Scott. She was on terms of considerable intimacy with Dr. Johnson, whom she disliked and whom she decried (writing under the signature of "Benzolio") in the *Gentleman's Magazine* in 1786 and 1793. She supplied Boswell with particulars about Johnson, but Boswell, knowing her prejudices, received them somewhat coldly, thereby offending her. Her portrait was painted by George Romney, whom she had met at her friend William Hayley's place in Sussex.

Seward, WILLIAM HENRY, statesman, was born at Florida, New York State, United States, on May 16th, 1801, and educated at Union College. He was called to the bar in 1822. He was elected Governor of New York

State in 1838, but in 1842 resumed practice as a lawyer at Auburn. During his two terms of office as senator (1849-59) he showed himself a zealous opponent of slavery, argued against the Compromise Bill, and helped to found the Republican party. His candidature for the Presidency not being adopted by his party (1860), he became Secretary of State under Abraham Lincoln (1861), an office which he retained till 1869. In the department of foreign affairs he encountered the difficulties occasioned by the War of Secession with singular ability and success. A desperate attempt was made on his life in 1865 by an associate of the assassin of Lincoln. He died at Auburn on October 10th, 1872. He was the author of an able *Life of John Quincy Adams* (1849) and other works.

Sewall, ELIZABETH MISSING, novelist, was born at Newport, Isle of Wight, on February 19th, 1815. For several years she received pupils at Bonchurch, a beautiful little village near Ventnor, but was chiefly known for her numerous novels of strongly accentuated religious tone, in accordance with the High Church views of which she was an ardent exponent. Her most popular stories were *Amy Herbert*, *Laneton Parsonage*, and *Margaret Perceval*, but she was also the author of numerous tales for children and books of devotion and history. She died at Bonchurch on August 17th, 1906.

Sewall (*Haplodon rufus*), representing the Haplodontidæ, the only family of the section Sciuromorpha (Squirrel-like Rodents) of the sub-order of Simple-toothed Rodents. It was first noticed about 1806 by the American travellers Lewis and Clarke, described in 1814 by Rafinesque under the name of *Anisonyx rufa* and, in 1829, by Sir John Richardson as *Aplodontia leporina*, since corrected to Haplodon. The body is stout and clumsy, about one foot long, the tail is very short, the claws of the fore feet (which, like the hind ones, have five toes) are very powerful and there are five molars in the upper and four in the lower jaw. In colour it is brownish with an intermixture of black, lighter and greyish below, the whiskers, claws and upper surface of the feet being whitish. It occurs in the states of Washington and Oregon between the Rocky Mountains and the Pacific, and is found also in parts of California and British Columbia. Like the Prairie Dog, which they resemble in some of their habits, the Sewallels are gregarious, burrowing easily and feeding on roots and berries. Their societies are smaller than those of the Prairie Dog and they affect the rich, moist land near the sources of streams. They have the curious habit of neatly cutting off some plant, packing it in bundles which are then laid out to dry in the sun and stored, probably for winter fodder. Whether they hibernate or not seems to depend upon the cold of the latitude and local conditions. Indians trap and feed on them and also sew their skins together for cloaks and blankets.

Sewer, a channel which serves to carry away waste water and liquid refuse, trade effluents, rainfall, etc.; the term drain is applied to a channel which carries off the drainage of one building only, and which communicates with a cesspool or similar receptacle, or with a sewer; a sewer being the larger duct which receives as tributaries the various drains which communicate with it. In some towns what is known as the separate system of sewerage is adopted, the rain water being carried away by a series of ducts distinct from those which carry household and trade effluents. Where the separate system is not adopted, the capacity of the sewers must be so regulated as to enable them to remove storm waters. It is usually calculated that, in the United Kingdom, the sewer should be capable of dealing with a maximum rainfall of one inch per hour, over and above the waste matters derived from other sources. The smallest sewers are usually made of earthenware pipes, varying from nine inches to two feet in diameter: the larger main sewers are made of brick, set in cement upon a bed of concrete; in vertical section their form is generally oval or egg-shaped rather than circular, this method of construction rendering them less liable to be silted up when only a small volume of sewage is flowing through them. Sewers are laid in straight lines, manholes being provided at the various junctions so as to facilitate inspection and to allow of the operation of flushing being performed. The fall of a sewer varies from about 1 in 100 in the smaller to 1 in 750 in the larger channels. The composition of sewage is, curiously enough, very little altered by the fact of the exclusion or presence of water-closet discharges; the average composition of sewage from water-closet towns and from towns in which dry systems of removal prevail not being strikingly dissimilar. Sewage contains, on an average, some twelve hundred or thirteen hundred parts of solid residue in 1,000,000 parts by weight, the amount of the suspended solids being rather greater than the amount of those which are held in solution. The most valuable constituents of the sewage from a manurial point of view are the nitrogenous compounds, potash salts, and the phosphates. It has been calculated that, on an average, the annual quantity of sewage per unit of population is 100 tons, and, were this made to yield its theoretical value as manure, it would amount to nearly £1 per head. The air contained in sewers differs somewhat in composition from the air of the atmosphere, gases being continually given off by the sewage and some percolation of ground air into the sewers usually occurring. Where the fall of a sewer is insufficient, and particularly when the level of a sewer is not properly regulated, or has become affected by subsidence (allowing of the collection of stagnant pools of sewage), this accumulation of foul gases in the body of the sewer is especially favoured. In such circumstances the sewer-air may be a serious source

of danger to those who work in the sewers. There is risk, too, of its finding its way into houses with imperfect drainage arrangements, and wherever means of escape are provided for the gases complaints of nuisance are almost sure to arise. With a view to securing some interchange of air in sewers and so making it safe for flushers and sewer-men to enter them, and with a further view to allowing of the escape of air at times when there is an increased flow of sewage in the sewers, and particularly after rainfall, it is necessary to provide means of ventilation. Gratings situated in the centre of the roadway are usually employed for this purpose, the distance between such gratings being one hundred yards or thereabouts. In some instances shafts are carried up the sides of houses with a view to causing the sewer-air to escape at points where it will not cause offence. Sometimes the air from sewers has been extracted and passed through a furnace so that it may be rendered innocuous. The method of ventilation by gratings in the middle of the roadway is, however, very rarely productive of annoyance when the sewer is in a satisfactory condition, but wherever these outlets can be protected by charcoal air-screens this additional precaution is advisable. The methods of disposing of town sewage have received a great deal of attention, especially since the undesirability of passing sewage directly into streams has been insisted upon. Having regard to the fact that many rivers are yet the main, if not the only source of drinking water for several towns and cities, it should be made a penal offence for riparian owners, whether these are towns, or villages, or private persons, to run sewage or other polluting matter into such streams. It is appalling to think what might happen to such a vast and populous community as London if the Thames above the Water Board's intake were fouled with the germs of a water-borne epidemic. Some form of chemical treatment of town sewage (the essence of which consists in precipitating the organic matter by the addition of agents such as lime, sulphate of alumina, etc.) is usually adopted; but the effluents after such treatment are in many cases still a source of injury to the streams into which they are discharged. Filtration of sewage is sometimes had recourse to, the material being discharged over a porous soil, and the flow being from time to time suspended in order to permit fresh supplies of oxygen to obtain access to the filter. The method of broad irrigation, in which the sewage is distributed over a sewage farm and utilised as manure for certain crops, has also been employed in several instances. This is no doubt the best means of dealing with sewage when land in sufficient quantity and of suitable character is obtainable.

Sewage Machines have been undergoing a continual process of development since 1830, when Barthélemy Thimonier, a French tailor,

arranged a mechanically-moved crochet needle which drew loops of thread through the cloth, each succeeding loop being passed through the previous one, thus making a chain stitch. The modern machine practically originated with Walter Hunt, of New York, who devised a needle with an eye near the point, and used two threads to make a lock stitch. Elias Howe, a native of Spencer, Massachusetts, re-invented this arrangement in 1846, and, after suffering for some years the neglect which is the fate of most inventors, laid the foundations of the present extensive trade in sewing machines. In all of the many modifications of Howe's device now in use, the needle is fixed to a vertical bar having an up and down motion given to it by a cam, and at each descent it carries the thread, which is passed through an eye near its point, through the fabric to be sewn, and on its ascent the friction between the cloth and the thread causes the latter to be left under the cloth in the form of a loop on one side of the needle, as shown at A in Fig. 1. A boat-shaped shuttle containing a small spool of thread and having a horizontal reciprocating motion is now passed

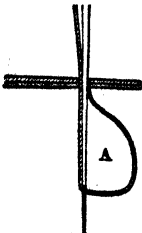


FIG. 1.

through this loop, so that one thread is twisted half a turn round the other, and the further ascent of the needle draws the threads tight, at the same time pulling the twist into the centre of the fabric. While the needle is at the upper part of its movement the cloth is advanced by



FIG. 2.

the length of one stitch, and the whole cycle of operations is repeated. This process results in the lock stitch shown at B (Fig. 2) and forms a very neat and secure seam. The feed mechanism for advancing the cloth between the stitches consists of a small metal block having on its upper surface a series of saw-like teeth, which works neatly under the needle in a slot in the plate on which the cloth rests. The fabric is pressed upon this block by a spring foot, through a hole in which the needle passes. While the needle is descending through the cloth, the feed block is raised and holds it securely while the stitch is being formed; when the needle is clear of the cloth, the block moves forwards through a distance equal to the length of one stitch; it then sinks and moves backwards and upwards to its first position. The chain-stitch machine is somewhat simpler, as the shuttle and lower thread are dispensed with. A loop is formed on the under-side of the cloth as above described, but on the ascent of the needle this is held by a hook, and the next descent of the needle is made through

this loop. The first loop is released from the hook, which engages with the second loop, and on the thread being drawn tight by the rising of the needle, a crochet stitch shown at C (Fig.



FIG. 3.

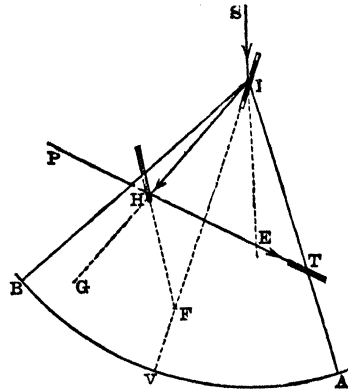
3) is formed. This uses more cotton, and is less neat and less secure than the lock stitch, but the machine is simpler, and therefore cheaper, and may be worked more rapidly than the lock-stitch machine. About four-fifths of the machines now in use are of the latter kind. Many attachments are sometimes used to facilitate special operations, such as hemming. The adjustments of sewing machines require more care than is usually bestowed upon them; both upper and lower threads are held tight by frictional devices which can be regulated, and it is important that the tensions of the two threads should be equal, and should be suited to the kind of cloth and thread used, in order that a perfect stitch may be made. It is also advisable to proportion the size of the needle to the size of the thread.

Sex, the differentiation of cellular elements, either alone or with other surrounding structures, into male and female, so that their union [REPRODUCTION] results in the stimulus of the latter into a new individual. In its simplest form sex shows itself in the union of similar gametes, reproductive cells, that is, incapable by themselves of giving rise to a new organism. Organisms producing such gametes are termed isogamous; the union of their gametes, conjugation; and its result (among plants at least), a zygospore. Such similar gametes may be free-swimming, ciliated, and pear-shaped, or planogametes, or without cilia or definite form (aplanogametes). Among the Protozoa each organism generally consists of such an undifferentiated conjugating gamete. But little higher in both the algal and the animal series heterogamy, or the differentiation of distinctly male and female gametes, arises. The former, the spermatozoid, or sperm-cell, is generally the smaller and more active, being a well-defined, ciliated, free-swimming mass of protoplasm. This form, it has been suggested, is the result of the excess of katabolism in a previously undifferentiated amoeboid cell, finding its outward expression in increased activity of movement. The female gamete, oosphere, ovum, or germ cell, on the other hand, is generally larger, spherical, unciliated and quiescent, the result of an excess of anabolism, i.e., of potential, rather than of kinetic, energy. The union of such heterogamous elements is termed fertilisation. Where male and female organs are borne by the same individual, and on the same branch or body segment, the organism may be termed monoclinal, the term hermaphrodite being unsuitable, as suggesting

self-fertilisation. Where male and female organs, though on the same individual, are more distant (as when in distinct flowers), the organism is termed monœcious. Where the organs occur on distinct individuals, it is termed dioecism, a condition which is the rule among the higher animals more than among the higher plants. It is now recognised that the sex of an embryonic organism is determined by the condition of the parents, as regards relative age, etc., by the quality and quantity of food supplied to the female parent or larvæ, by temperature, and by other similar external conditions. Abundant nourishment tends to produce females; but it is difficult as yet to arrive with certainty at any other law of general application as to sex determination. Among some worms, such as the Rotifera, and some crustaceans, such as the cirripedes, the male becomes degenerated into a mere appendage, or "complemental male," borne by the female, and a similar condition occurs in the algal *Edogonium*. Among insects the sexes are most strongly contrasted by secondary sexual characters, such as the smaller size, greater activity, brighter colours, and sound-producing powers of the male; while among bees, ants, and other Hymenoptera, we may almost be said to have more than two sexes. Among mammals, offensive organs, such as horns and tusks, and ornamental appendages, such as manes and colour-patches, often mark the males; but among birds the contrast of sex is yet more striking in the generally gay plumage and nuptial song of the male. Numerous subsidiary sex questions, such as apogamy, parthenogenesis, etc., are treated separately. The advocacy of Charles Darwin gave importance to his theory of Sexual Selection, according to which the choice of a mate by the female animal has had much to do with the evolution of secondary sexual characters in the male, such as song, gay plumage, colour, wattles, moustaches, etc. Alfred Russel Wallace has argued that this process is entirely controlled by natural selection, while other biologists think the part played by it in the origin of species quite subordinate.

Sextant is an instrument for measuring the angular distance between two objects. The principle underlying its action is illustrated in the accompanying figure. I and H are two mirrors perpendicular to the plane of the paper. Light from a celestial object, S , is reflected at I along HI , and again reflected at H along HT , this direction being the same as that of light from another object, P . If the lines I and H be produced, they meet at E , SI produced cuts PT at E , and HI is produced to some point, G . The angular distance between P and S is the angle E , and that between the two mirrors is the angle F . It can be shown that $F = \frac{1}{2} E$; for $E = \angle HIE - \angle HIE = 2 \angle HIF - 2 \angle HIF$, since HI is bisected by IF and GE by HF , and $F = \angle HIF - \angle HIF \therefore F = \frac{1}{2} E$. In the actual instrument the mirror H is fixed on the arm

IB , while IA is another fixed arm, making an angle of 60° with IB . The mirror H is therefore parallel to IA . The arc AB measures 60° , so that the mirror I is at its centre, and is fixed to a movable radius IV having a vernier



at v . The mirror H is only silvered over its lower half, so that the object P is viewed directly through its upper part. The instrument is held so that the object P is seen directly through the telescope T , on the arm IA . IV is then moved until the image of S appears to touch P . The position of v is then noted; this gives the angle $VI A$, which is equal to HFI (since IA and HF are parallel) and half SEI . It is usual to have the arc AB graduated not in degrees, but in half-degrees, each half-degree being marked at double its value. Thus, if AV be really 20° , it is marked 40° ; hence the readings give at once the angular distance between P and S . The mirror I is usually termed the index-glass, and H the horizon-glass, because, in taking the altitude of any object at sea, the horizon is viewed directly through its upper part. This instrument was devised by John Hadley (1682-1744), and it is usually known as Hadley's sextant. It is specially of use in making measurements at sea, since the movement of the ship has no effect on the coincidence of the object and image. For measuring longitude instruments giving an accuracy of a few seconds are employed, the radius being generally about twelve inches. "The circular arc of the instrument being originally one-eighth of a circumference," says R. E. Anderson, "it was called 'octant,' and as the double reflection makes one degree on the arc represent two degrees between the objects observed, the octant was therefore a measure of ninety degrees, and thus obtained the name quadrant. In the same way, when Captain Campbell in 1757 first proposed to extend the circular arc to one-sixth of a circumference in order to be able to measure up to 120 degrees, Hadley's instrument then became a sextant."

Sexuality in Plants was suspected by Aristotle and Theophrastus, and was more fully recognised by Pliny, these writers being more or less familiar with the division of sexes in the date-palm; but until the 17th century mere difference in habit was often taken to indicate sex, as in the familiar case of the so-called male and lady ferns. Clusius (1526-1609), however, terms the staminate papaw the male, and the carpellate the female. Even Cæsalpinus (1519-1603) and Malpighi (1628-94), who traced the development of the embryo, seem ignorant of the function of the pollen. Grew and Ray at least formed conjectures of what we now know to be the truth; but Linnaeus and Sachs attribute the demonstration of sex in plants to Camerarius (1665-1721). Further experimental confirmation was given by Bradley (1717), Philip Miller (1751), and Linnaeus assumed sexuality in making the sexual organs the basis of his classification. Kölreuter (1733-1806) first studied the artificial production of hybrid plants, and Sprengel (1750-1816) detected the frequent occurrence of dichogamy and the importance of the aid of insects in pollination. After Thomas Andrew Knight, Dean Herbert, and K. F. Gärtner had also shown that "Nature abhors perpetual self-fertilisation," Charles Darwin arrived at the conclusion that cross-fertilisation secures a stronger and more numerous progeny. Schleiden in 1837 first pointed out the general protrusion of pollen-tubes by the pollen-grains and their passage into the micropyle; but not till 1846 was it clearly shown by Amici that the egg-cell is formed in the embryo-sac before fertilisation. Among cryptogams, though conjugation in *Spirogyra* was maintained by Vaucher to be sexual in 1803, and spermatozoids, observed in 1822, had been declared by Unger in 1837 to be male organs, mainly from their resemblance to those of animals, it was not till 1849 that Hofmeister, who did much also to show the absence of spermatozoids in the pollen-tube of the higher plants, gave a complete account of the "alternation of generations" in the higher cryptogams and the fundamental identity of all cases of sexuality as consisting of the fertilisation of a germ-cell by a sperm-cell. It seems that some of the lowest plants (Protophyta) may be destitute of sexuality; whilst in others more highly organised, such as some *Saprolegnias* and the *Basidiomycetes* among Fungi, it has been lost by a degeneration-process known as apogamy.

Seychelles, a group, with its dependencies, of eighty-nine islands in the Indian Ocean, 1,000 miles east of Zanzibar. They are of granitic formation with encircling reefs of coral, and rise steeply from the sea. The total area amounts to 149½ square miles, Mahé, the largest, occupying 55½ square miles. Other islands are Praslin, Silhouette, La Digue, Curieuse and Félicité, while the dependent islands comprise, among others, the Amirantes,

Alphonse, Bijoutier, St. François, St. Pierre, the Cosmoledo, Astove, Assumption, the Aldabras, Providence and Flat Island. The vegetation is luxuriant, and though they are only three or four degrees south of the equator, the tropical heat is tempered by sea-breezes, and the climate is healthy. All but half a dozen are uninhabited. From 1742 to 1798 they belonged to France, but were conquered by the British, and were under the government of Mauritius until 1888. They are now administered by a Governor, with an Executive Council of three members and a Legislative Council of six members (three official and three nominated unofficial). Almost every tropical product can be raised, but coconuts and their oil, with sperm-oil, tortoise-shell, vanilla, soap, guano, salt fish, coffee and cacao are the chief exports, the negro population being averse from labour. Port Victoria, in Mahé, is the chief harbour and the administrative centre. Pop. (1901), 19,237.

Seymour, EDWARD, 1ST EARL OF HERTFORD and DUKE OF SOMERSET, the Protector, was born about 1506, being the eldest surviving son of Sir John Seymour (1476-1536), of Wolf Hall, Wiltshire. The Seymours claimed to be descended from a companion of William the Conqueror, who derived his name from St. Maur-sur-Loire, in Touraine, France. Edward was educated at Oxford and then at Cambridge. Before he was twenty he was employed in military commands in France and held several posts in the household of Henry VIII., whose favour he enjoyed in an exceptional degree. In June,



EDWARD SEYMOUR, DUKE OF SOMERSET.

1536, a week after his sister Jane's marriage to the king, he was created Viscount Beauchamp of Hache, Somerset, within a month was appointed Governor and Captain of Jersey, and in August became Chancellor of North Wales. Though the queen's death might have been thought likely to jeopardise his interests, it did not seem to affect his influence with the king, who visited him, along with Cromwell, at Wolf Hall and deputed him to bring Anne of Cleves from Calais to London. In 1541 he was made Knight of the Garter and in the following year Warden of the Scottish Marches. In 1544 he was ordered to proclaim Henry guardian of the infant Mary, Queen of Scots, and undertook an expedition against Scotland which had con-

cluded an alliance with France. He harried the south-eastern counties and sacked Edinburgh, but only succeeded in confirming the Scots' friendship with France and still further embittering their feelings towards England. In the beginning of 1545 he was in charge of operations in France and a dashing sally from Boulogne, in which he routed a force twice as numerous as his own, brought him great credit. A serious English reverse at Ancrum Moor, in Roxburghshire, induced Henry to summon Seymour to lead another invasion of Scotland. He again ravaged the Borders and was savage enough to destroy the beautiful Border abbeys, whose glorious ruins still move the admiration of all beholders. On Henry's death in 1547 the struggle between the Duke of Norfolk and himself for power during the minority of Edward VI. ended in his favour and he was named Protector with almost regal authority. He was appointed High Steward for the Coronation, Treasurer for the Exchequer, and Earl Marshal, and was, besides, created Baron Seymour of Hache and (February 18th, 1547) Duke of Somerset. He at once devoted himself to drastic religious reforms on Protestant lines, a policy which he pursued far too energetically and which ended in a good deal of popular odium, though his sincerity was unimpeachable and not that of a mere partisan. One of his State dreams was the marriage of the young king and the young Queen of Scots, but here again his impetuosity ruined the project, for though he defeated the Scots signally at Pinkie (September 10th, 1547)—the last battle between England and Scotland as independent kingdoms—he naturally failed to conciliate them, and the treaty for her marriage with the Dauphin, concluded in 1548, put the finishing touch to a wise and statesmanlike scheme. His failure to save his brother Thomas, Baron Seymour of Sudeley, who had married Catherine Parr, also increased the disfavour in which he was now being held. As often happens in such circumstances, national difficulties crowded upon him at this juncture. The Scots rapidly regained all their captured castles; the French were making headway, and war with France was again inevitable; economic distress provoked Robert Ket's and other rebellions, and the adherents of the "old religion" fanned the flames of general discontent. Somerset's enemies caballed against him, and in October, 1549, he was sent to the Tower charged with abuse of power. Complete submission saved him for the moment and it even seemed as if he might regain his position. But failure of health in September, 1551, when he was concerting the downfall of his rivals, gave them the opportunity to mature counter-plans of their own and he was again placed in the Tower. He was tried for treason-felony on December 1st, 1551, in Westminster Hall. The case for treason collapsed, but he was condemned for felony and sentenced to death. He was executed on Tower Hill, London, on January 22nd, 1552. A man of pure morals,

earnest in his religious convictions, of strong character, an able general and a statesman of lofty aims, he was yet inordinately ambitious, greedy of money, power and possessions, and unskilled in the handling of men.

Seymour, SIR EDWARD, Speaker of the House of Commons, was born in 1633 and entered Parliament in 1661 as member for Gloucester. He soon proved himself a capable administrator, among the posts he filled being that of Treasurer of the Navy. On February 18th, 1673, he was elected Speaker, but at first gave umbrage by alleged partisanship with the Court. Latterly by his knowledge of the Constitution and his business aptitude he won the respect of the House, though he always comforted himself with extraordinary dignity. In March, 1679, he was returned for Devonshire, and being again unanimously chosen Speaker, his selection was disallowed by the King, to whom he was no longer acceptable, an interference with their rights that the Commons hotly resented. As a private member he was concerned for the condition of the Protestant religion in view of the accession of James II., but opposed the Exclusion Bill, urged the Duke of York to change his Church, and at length proposed that, while James should wear the crown, William of Orange should act as Regent. In 1685 he succeeded to his title, becoming fourth baronet. He was in sympathy with the Revolution and framed the Association to secure the religion, laws and liberties of the people in a free Parliament. In March, 1692, he became a Lord of the Treasury with a seat in the Cabinet, but lost his place when the Whigs took office in 1694. Soon afterwards he was rejected at Exeter, and had to seek shelter in the small borough of Totnes, but was again elected for Exeter in 1698. Louis XIV.'s patronage of the Pretender drove Seymour and other Tories into the Dutch camp, and he supported the military programme of William. The succession of Anne improved his prospects, and, in April, 1702, he was made Comptroller of the Royal Household, and, in May, Ranger of Windsor Forest. His hostility to the Duke of Marlborough, however, was fatal to further advance, and when the Whigs got the upper hand his influence was extinguished. He died at his seat of Maiden Bradley, Wiltshire, on February 17th, 1708.

Seymour, FREDERICK BEAUCHAMP PAGET, LORD ALCESTER, Admiral, was born in London on April 12th, 1821, and educated at Eton. He entered the navy in 1834 and rose in various stages from mate on the *Britannia* to commander in 1847. In 1852 he volunteered for service in Burma, in 1853 was on the North American and West Indian station, and in 1854 was sent to the White Sea under Sir Erasmus Ommaney. In 1853 he took the *Meteor* floating battery to the Crimea and brought it back to Portsmouth next year, two adroit feats of seamanship. He commanded for the following six years on the Australian

station, being at the head of the naval brigade in the Maori war. In 1870 he was promoted rear-admiral and from 1872 to 1874 was one of the Lords of the Admiralty. He commanded the Channel Fleet from 1874 to 1877, was made vice-admiral in 1876, and created K.C.B. in



LORD ALCESTER.

(Photo: J. Maclardy, Oscestry.)

1877. As commander-in-chief in the Mediterranean he was entrusted, in 1880, with the demonstration off the coast of Albania, consequent on the refusal of Turkey to cede Dulcigno to Montenegro. On the compliance of the Porte, Seymour received the G.C.B. (1881). On July 11th, 1882, he conducted the bombardment of the forts at Alexandria and the later coast operations in the Egyptian war, for his services in which he was created Lord Alcester. From 1883 to 1885 he served once more as an Admiralty Lord, retired in 1886, and died in London on March 30th, 1895.

Seymour, JANE, third Queen of Henry VIII., was the eldest of the eight children of Sir John Seymour, of Wolf Hall, Savernake, Wiltshire, where she was born about 1509. She was a gentle, accomplished girl, not remarkable for beauty, and was attached as lady-in-waiting to Catherine of Aragon, and afterwards to Anne Boleyn. From the end of 1535 the king paid her marked attention, but Jane was able to keep the monarch's attachment within the bounds of propriety, though she had to remind him that her honour was her fortune. On May 20th, the day following Anne's execution, Jane went secretly to Hampton Court and was formally betrothed to Henry, the marriage being privately celebrated in London on May 30th, 1536. The king treated her with considerable affection, but once, when she begged him to restore the dissolved abbeys, he bade her mind her own business if she would avoid her predecessor's fate—a hint the queen could not afford to despise. On the 12th of October, 1537, she was confined at Hampton Court of a son, afterwards Edward VI., but complications setting in she died twelve days afterwards. She was buried with great pomp in the choir of St.

George's Chapel, Windsor, where in his turn Henry was laid beside her.

Seymour, ROBERT, artist, was born in London about 1800. His father died before his birth and his mother was too poor to give him more than a very ordinary education. He was apprenticed to a pattern draughtsman of Smithfield, but having taught himself to draw and paint, took to the career of an artist when his time was out. In 1822 he was represented at the Royal Academy, but he never had another picture hung there. Turning to the illustration of periodicals and books, he showed equal facility and versatility. His work suffering greatly at the hands of the inferior engravers to whom it was commonly entrusted, he directed his attention to etching and produced many plates. He afterwards adopted the method of lithography, and between both processes attained to an enormous output. Excepting for a period of four months, he was illustrator of *Figaro in London* from 1831 till his death. His work for other publications was not interrupted, however, and his 36 etchings for Hervey's *Book of Christmas* (1835) were probably his best work in that line. Having illustrated for Chapman and Hall *The Squib Annual* (1835-6), he suggested a series of Cockney sporting plates to be issued in monthly parts with letterpress. Hall commissioned Charles Dickens to supply the text and in this way was begun the immortal *Papers of the Pickwick Club*. Seymour was never very tolerant of criticism (he had had to put up with a good deal of uninformed criticism in his career at various times), and, find-



ILLUSTRATION BY ROBERT SEYMOUR.

ing Dickens's dictation, though kindly meant and expressed, distasteful, withdrew from the enterprise after executing the plates for the second part. The unfortunate man's nerves were completely unstrung and he shot himself in London on April 20th, 1836.

Seymour, THOMAS, BARON SEYMOUR OF SUDELEY, fourth son of Sir John Seymour, of Wolf Hall, Wiltshire, was born about 1508. He was employed on State affairs in various capacities during several years and, on the

outbreak of war between England and Spain and also with France, was made Marshal of the English army in the Netherlands, being second in command to Sir John Wallop (1543). For his services he was appointed in 1544 Master of the Ordnance for life and became admiral of the fleet in October of the same year. In 1545 he was entrusted with the defence of the Kent coast and the Strait of Dover. By Henry VIII.'s desire, he was created Baron Seymour of Sudeley and Lord High Admiral a few weeks after the king's death. He soon afterwards began to intrigue against his elder brother, the Protector Somerset, whom he seriously annoyed by marrying Catherine Parr, widow of Henry VIII., although she was an old flame of his. He abused his position as Lord High Admiral, partly by encouraging privateering in the English Channel and partly by utilising his naval strength to forward his own ends. In 1548 he suffered several defeats off the shores of Scotland, and, on his return to London, made overtures for the hand of Elizabeth, whom he had treated with undue familiarity until Catherine removed her from his influence. His underhand conduct at last precipitated his ruin. He was arrested in his house near Temple Bar on January 17th, 1549, and sent to the Tower. A Bill of attainder passed both Houses, and he was beheaded on Tower Hill on March 20th, 1549. He was a capable soldier, courageous and of handsome appearance, but ambitious, unscrupulous, overbearing and profligate.

Seyne-sur-Mer, LA, a town of the department of Var, France, 4 miles S.W. of Toulon. It is an important shipbuilding centre, the yards being amongst the best in Europe. Other industries include iron-founding and fisheries. Pop. (1901), 21,002.

Sfax, a seaport of Tunis, Africa, 70 miles N.N.E. of Gabes. It occupies the site of the ancient Taphura and is sometimes styled the City of Cucumbers. It was captured in the 12th century by the Sicilians and occupied by the Spaniards for a short time in the 16th century. During the French conquest of Tunis in 1881, the town was bombarded. It consists of three quarters—the European in the south, the French camp in the north, and the Arab town in the centre. The country houses, villas, orchards and gardens of the prosperous merchants occupy eligible sites for several miles around on the north and west. Dates, almonds, grapes, figs, peaches, olives (in the Middle Ages it was noted for its great export of olive oil), and, in wet years, melons and cucumbers grow profusely. A brisk trade is done in textiles, fruit, vegetables, oil, soda, essences, esparto grass, wool, sponges and pistachio nuts. It is the seat of a bishopric and has numerous educational establishments. Pop. (estimated), 50,000.

Sforza, a celebrated Italian family, which controlled the destinies of Milan for a hundred

years, was founded by JACOPO SFORZA (1369-1424), the son of a farmer at Cotignola, in the Romagna, who became a famous *condottiere*, and died constable to Joanna II. of Naples. His real name was Muzio Attendolo, which he abandoned for that of Sforza ("stormer"). FRANCESCO SFORZA (1401-66), his natural son, an able tactician and general, at first supported the Duke of Milan against the Venetians and Florentines, but afterwards supported the latter in their struggle with the Milanese. In 1441, however, he married the Duke's only daughter, and on his death in 1447 laid claim to the duchy, which he obtained after three years' hard fighting. Meanwhile he had wrested the March of Ancona from the Pope (1434), and yielded it to him again (1447). He was a wise ruler and a patron of learning, and was much beloved by the Milanese. LODOVICO MARIA SFORZA, "The Moor" (1451-circa 1508), third son of the preceding, succeeded his brother GALEAZZO (Duke in 1466; assassinated 1476), and his nephew GIOVANNI GALEAZZO, the latter of whom he probably poisoned (1494). Whilst Regent, in 1491, he had incited Charles VIII. of France to invade Italy and attack Naples, but he now became alarmed at the success of the French, and joined the league by which Charles was expelled. In 1499 the Milanese were conquered by Louis XII., and in 1500 Lodovico was carried captive to France, where he passed the remainder of his life. His son MASSIMILIANO—who, with his brother, had been sent to Germany—was recalled to Milan by the Swiss, who had defeated Louis XII. in 1512. After the battle of Melegnano (Marignano), however, he submitted to Francis I. of France (October, 1515). Stupid and indolent, the loss of power did not disturb him, and he was quite content to pass the rest of his existence on the estates which had been granted to him in France. He died in Paris in 1530. His brother FRANCESCO MARIA (1492-1535) was restored to the duchy upon the defeat of Francis I. at Bicocca in 1522. Having joined the Holy League against Charles V., he was compelled to submit to the conditions laid down by the victorious Emperor. His death ended the dynasty of the Sforzas.

Sgraffito, or GRAFFITO, from an Italian word meaning "to scribble" or "to scratch," is used in an antiquarian and an æsthetic sense. Archæologically, it is applied to those instances which have been preserved of an ancient custom that has its modern counterpart (which, however, in these days is an abuse and nuisance and inexcusable), in which a wall, pillar, tablet, or other surface was covered with scribbles and scratches. They partook sometimes of the nature of crude sketches, sometimes they consisted of sentences and words, sometimes of meaningless lines, possibly an attempt at design or decoration. In some cases they have revealed facts of historical interest. Artistically, it indicates a species of decora-

tion, executed by covering a surface, as of plaster, stucco, or clay, of one colour with a thinish coating of a like material in another colour, and then forming designs in the colour of the hidden substance by scratching through the outer coat (while it is soft; if dry it will be liable to chip) with a suitable tool. Thus, the figure of a lotus, treated conventionally, might be shown in red (the concealed colour) on a surface of blue (the superimposed colour) and, of course, much more elaborate effects might be obtained.

Shad, a common name, with or without an epithet, for several fishes of the Herring family, generally ranked with the Herring, but sometimes made a separate genus. They are marine fish, ascending rivers to spawn, depositing their eggs on the bottom. In form and general appearance they resemble Herrings, but are of larger size, two feet being a usual length, though specimens four feet long are by no means unknown. Their flesh is valued for food. The Common or Allice Shad (*C. alosa*) frequents the British coasts and is found in the Mediterranean, other European waters, and in the estuaries of some of the larger rivers. In the Severn it is sometimes taken as high up as Worcester and, in any case, the flavour of the fish is said to be improved by a fluvial habitat for a period. At sea it is occasionally caught on lincs with a mackerel bait. The Twaite Shad (*C. finta*) is abundant round British coasts, and is found in the Thames. It enters the English streams in May and goes down to the sea in July. It also occurs in the Nile. Its ordinary length is from twelve to sixteen inches. The American Shad (*C. sapidissima*), with an average weight of 4 or 5 lbs., is a valuable food-fish. The Herring which is restricted to the Caspian (*Clupea caspia*) is intermediate between the Herrings and the Shads.

Shaddock (*Citrus decumana*), so called from Captain Shaddock, who, at the beginning of the 18th century, introduced the shrub into the West Indies from China. Like all the orange tribe, it has winged petioles to its large leaves; its shoots are downy, and its smooth, pale yellow, thick-rinded fruit sometimes reaches 20 lbs. in weight. Large specimens are sold in London as pomeloes; small ones, as forbidden fruit.

Shadow. When light falls upon an opaque body, it cannot traverse the space behind that body, and hence a region of darkness is produced, or the body is said to cast a shadow. If the light came from an absolute point, a projection of the object would be cast upon any surface behind it, the form of the projection depending on the shape of the surface and its position with respect to the object and the light. Usually the light does not emanate from a point, but the source of light has measurable size; in this case each point of light forms its own shadow and the final re-

sult is a number of overlapping shadows, the darkest region being that where most overlapping takes place, and the lightest where least overlapping occurs. A shadow looks darker or lighter according as much or little extraneous light is about, its depth being merely estimated by contrast. If the surface receiving the shadow be near the object, a deeper shadow is obtained than when it is far away, owing to the fact that the rays of light which would be primarily intercepted by the object can, by reflection from other surfaces, etc., find their way into the otherwise dark region, if space enough be allowed for this behaviour.

Shadwell, THOMAS, dramatist and poet laureate, was born at Broomhill, Weeting, Norfolk, in 1640 or 1642. He was educated at home, the Grammar School of Bury St. Edmunds, and, for a time, at Caius College, Cambridge. After a season of travel on the Continent he settled in London and began to write for the stage, modelling himself, as he said, on Ben Jonson. His first play was *The Sullen Lovers* (1668), and among its successors were *The Humourists* (1670), *The Miser* (1671), *Epom Wells* (1672), one of his best and coarsest, *The Enchanted Island* (1673), an opera constructed out of *The Tempest*, *Timon of Athens* (1678), a revision of Shakespeare's drama, *The True Widow* (1678 or 1679), and *The Lancashire Witches* (1681). For several years Shadwell had been on more or less friendly terms with John Dryden, but growing coolness ended in rupture and in 1682 he was ridiculed by Dryden as M'Flecknoe in his satire of that name, and as Og in the second part of *Absalom and Achitophel*. The quarrel was caused by the scurrilous tone of *The Medal of John Bayes* (written by Shadwell as a counterblast to *Absalom and Achitophel* and *The Medal*), which satirised the opponents of the Court party. After a long spell Shadwell produced *The Squire of Alsatia* (1688), one of his most successful plays, and when Dryden lost the laureateship at the Revolution Shadwell, by the irony of fate and the paucity of Whig poets, became his successor. In 1689 his comedy of *Bury Fair* appeared, in 1690 the *Amorous Bigot*, and in 1691 *The Scowlers*. He died suddenly in London on November 19th, 1692.

Shaftesbury, or SHASTON, a town of Dorsetshire, England, 28 miles N.N.E. of Dorchester. It is a place of remote antiquity, being the Mount Palladur or Caer Sceaff of the Britons, in allusion to its situation, for the town is built on high ground and the approach is steep. It was also the site of a Roman station. On the ground occupied by a pagan temple Alfred the Great raised a Benedictine abbey in 888. The position of the abbey is definitely ascertained, though hardly any ruins remain. Edward the Martyr, who was stabbed to death at Corfe Castle by his mother-in-law Elfrida in 978, was buried in the abbey. The principal structures are St. Peter's Church, dating

from the 15th century; Holy Trinity Church, the churchyard of which is noted for its lime-tree avenues; the town hall; Temperance Hall; Literary Institution; the Westminster Memorial Cottage Hospital, opened in 1874 to the memory of the 2nd Marquis of Westminster, and the market-house, erected by the Marquis of Westminster. The trade of the town consists chiefly in dairy produce, especially cheese and butter, the produce of the rich grazing lands in the vicinity. Shaftesbury gave the title of Earl to the family of Anthony Ashley Cooper. Pop. (1901), 2,027.

Shaftesbury, ANTHONY ASHLEY COOPER, 1ST EARL OF, statesman, was the son of Sir John Cooper, of Rockborne, in Hampshire, and



ANTHONY ASHLEY COOPER, 1ST EARL OF SHAFTESBURY.

was born at Wimborne St. Giles, Dorsetshire, on July 22nd, 1621. After studying at Exeter College, Oxford, he entered Parliament as member for Tewkesbury in 1640. When the Civil War broke out, he at first supported the Royal cause, but in 1644 went over to the Parliament, and was given the command of the troops in Dorsetshire. He sat for Wiltshire in the Barebones and first Protectorate Parliaments, but was excluded by Cromwell from that which met in 1656. He thereupon joined the Opposition, and afterwards took a leading part in effecting the Restoration, being one of the twelve commissioners sent to Breda to invite Charles II. to return, and being created Baron Ashley of Wimborne St. Giles in recognition of his services (1661). In the legislation which followed he was usually to be found on the side of toleration and against persecution. He must be held in some measure responsible for the misdeeds of the Cabal Ministry (1667-73), although he endeavoured to prevent the "stop of the exchequer" (1672), and probably wished to maintain the Triple

Alliance. In 1672 he was made Earl of Shaftesbury and Lord Chancellor, signalising himself in 1673 by a speech advocating war against Holland ("Delenda est Carthago!" he vehemently exclaimed), as a formidable obstacle to the commercial supremacy of Great Britain. But the success of the Test Bill in the following year proved fatal to the Cabal. He now put himself forward as the champion of popular rights, and began to intrigue with Monmouth. In consequence of his hostility to the prorogation of Parliament in 1677 he was sent to the Tower, where he remained for a year. His conduct during the excitement occasioned by the Popish Plot (1678-80) marks him as a reckless and shameless demagogue. Yet England owes him a debt of gratitude for the Habeas Corpus Act, passed after his return to power as President of the Council in 1679. He only held office six months, for his attempt to impeach the Duke of York broke down, and, after his appearance at the Oxford Parliament with an armed body of followers, he was again lodged in the Tower (1681). The bill charging him with high treason was thrown out by the Middlesex Grand Jury, but he had been sinking deeper and deeper into intrigue, and in November, 1682, he prudently fled to Amsterdam, where he was received with the bitter gibe, "Nondum est deleta Carthago." His health was in a precarious condition by now and he died in Amsterdam on January 21st, 1683, and was buried at Wimborne St. Giles. Shaftesbury is the Achitophel of John Dryden's satire.

Shaftesbury, ANTHONY ASHLEY COOPER, 3RD EARL OF, philosopher, grandson of the 1st Earl, was born at Exeter House, in London, on February 28th, 1671, and educated privately, under John Locke and Elizabeth Birch, and at Winchester, where he was unhappy owing to the persecution of his schoolmates. After duly performing the grand tour he entered Parliament as Whig member for Poole (1695), but three years later the state of his health forced him to abandon politics. During the remainder of his blameless career, which was early cut short by consumption, he led the easy-going life of an affluent literary philosopher. He died at Naples, whither he had proceeded to mitigate his complaint, on February 4th, 1713, and was buried at St. Giles's, Dorsetshire. The leading idea in his *Characteristics of Men, Manners, Opinions, and Times* (1711) is that the right order of the universe is maintained by means of a due balance between the various parts of which it is composed. So it is also with the individual, who is the subject of various passions, appetites, and affections, and human society holds a middle place between the two, and is regulated by the same law. Thus, for Shaftesbury, morality seems to have occupied much the same sphere as the æsthetic feelings. Whatever transgresses the law of the universe is repugnant to the "moral sense" or "taste," and

this is the origin and sanction of our notions of right and wrong.

Shaftesbury, ANTHONY ASHLEY COOPER, 7TH EARL OF, philanthropist, was born in London



LORD SHAFTESBURY.
(Photo : Russell.)

on April 28th, 1801, and educated at Harrow and Christ Church, Oxford. His parliamentary career began in 1826, when he was elected Conservative member for Woodstock; he afterwards represented Dorchester (1830-1), Dorsetshire (1833-46), and Bath (1847-51), and held several Government offices prior to his succession to the earldom in 1851. In 1862 he was made Knight of the Garter. Soon after his entrance into

Parliament he showed himself a vigorous opponent of *laissez faire*, and his unwearied efforts on behalf of the labouring population at last bore fruit in the Act forbidding the employment in mines of women and of boys under thirteen (1842), while his name is pre-eminently associated with factory legislation. Another measure, which realised one of his earliest hopes, was the Ten Hours' Bill of 1847. Other objects which engaged his active sympathy were the protection of chimney-sweepers' apprentices, in whose favour he obtained an Act of Parliament, the establishment of ragged schools, and the erection of sanitary dwellings for the poor. He died at Folkestone on October 1st, 1885. In his religious views Lord Shaftesbury was an ardent Evangelical. He warmly supported the British and Foreign Bible Society, the London City Mission, the Ragged School Union, of which he was President for more than forty years, the Young Men's Christian Association, and other institutions of a similar character. By marriage he was the stepson-in-law of Lord Palmerston, who had such implicit confidence in his judgment in such matters that he had practically the bestowal of all the Church patronage that fell to the disposal of the more worldly-minded statesman. Lord Shaftesbury was, in the highest sense, a benefactor of his kind. He conquered the caste feeling of his order to a surprising degree and allowed the claims of humanity to assert themselves to a very large extent. Sympathy was with him no mere abstraction or catch-phrase, and the influence of personal leadership and contact was the unfailing hall-mark of his philanthropy. Given a cause of the righteousness of which he was personally convinced, he never hesitated to make it his own. In one sphere of usefulness he partially outlived his reputa-

tion. He did not take at all kindly to the Education Act of 1870, which, in the long run, led to the closing of several ragged schools, the languid existence of some of which collapsed before the vigorous life of the new board schools. He occasionally permitted himself to use language about the School Board of London which was not justified by the facts. But there can be no question, on a survey of his noble career, that had he been a younger man when the great change came about, he would have taken a wider and wiser view of the entirely beneficial effects of national compulsory education.

Shag. [CORMORANT.]

Shagreen, (1) the prepared skin of the shark and other fishes of the same order which was at one time used as a covering for watch and instrument cases, etc. In this sense the word may also denote the unprepared skin. (2) A kind of leather made from the skin of the horse, the ass, and other animals. Whilst the skin is still moist and soft, a seed belonging to the genus *Chenopodium* is forced down upon it, so that it becomes embedded in the surface. As soon as the skin is dry, the seeds are removed, and the surface is pared down almost to the level of the cavities they filled. The skin is then soaked in water, the result being that the cavities swell up and produce a blotched or granular appearance. The leather is frequently dyed with the green resulting from the action of sal ammoniac on copper filings, but it will take other colours as well.

Shah, the proper title of the king in Persia, Afghanistan, and other states of Southern and Central Asia. A son of the king may also claim the title. In Persia the monarch is frequently designated *Padishah* (Great Shah; Shah-in-Shah), a title which in Europe, however, is more commonly bestowed on the Sultan of Turkey and, in India, was given to the Great Mogul and is now applied to the sovereign of the United Kingdom as Emperor of India.

Shahabad, a district of Bengal, India, forming the south-western portion of the Patna Division and occupying the angle formed by the junction of the Son and Ganges. It covers an area of 4,365 square miles, of which the northern portion, two-thirds of the whole, is low-lying and fertile, while the southern is part of the Kaimur Hills, a branch of the Vindhya range. Besides the boundary-rivers already named, the principal streams are the Karamnasa, Dhoba and Dargauti. The fauna includes the tiger, bear, leopard, deer, wild boar, jackal, hyæna, fox, nyghai and several game birds. Limestone and sandstone are met with in quantities, and alum, slate and iron occur. Rice is the staple crop, but wheat, barley, maize, peas, lentils, oil-seeds, various vegetables, cotton, hemp, jute, poppy, sugar-cane, betel, tobacco, indigo and safflower are cultivated. The manufactures include sugar, paper,

saltpetre, blankets, cotton and brass utensils. Arrah (50,000), the capital, was the scene of one of the most stirring episodes of the Mutiny of 1857. Pop. (1901), 1,963,762.

Shah-Jahan (d. 1666), the fifth emperor of the Mogul dynasty, succeeded his father Jahan-gir, at Delhi, in 1627. After two campaigns against the princes of the Deccan, which resulted in an extension of his dominions, and some unsuccessful efforts to regain Kandahar from the Persians, he fell into the hands of his rebellious son, Aurungzebe, and was imprisoned in the citadel of Agra, where he remained till his death. He was accounted a wise and just ruler. He was the founder of the present city of Delhi (still known to its Mohammedan inhabitants as Jahanabad), where he set up the famous peacock throne, and such buildings as the magnificent Taj Mahal (the mausoleum of his favourite wife by whose side he was laid), the Palace and Pearl Mosque, all three in Agra, attest his love for architectural display.

Shahjahanpur, a district in the North-West Provinces, India, forming the most easterly portion of the Rohilkhand Division, occupying an area of 1,745 square miles. It runs in a north-easterly direction from the Ganges to the Himalaya, part of the territory being malarial, partly jungle, and partly under cultivation. The principal rivers are the Gumti, Khanaut, Deoha, Garra and Ramganga. The wild beasts include the tiger, lynx, leopard, wild hog, deer, antelope, and nyghai, besides large numbers of game birds. The principal crops are rice, cotton, wheat, barley, oats, oil-seeds, pulse, vetch, peas, sugar-cane, and various vegetables. The only mineral is nodular limestone, which is either burned for lime or used for road metal. Sugar and rum are the chief manufactures. The district was a hotbed of mutiny in 1857. The capital Shahjahanpur (75,662) was founded in 1647, and named after the Emperor Shah-Jahan. Pop. (1901), 921,624.

Shairp, JOHN CAMPBELL, man of letters, was born at Houston, in Linlithgowshire, Scotland, on July 30th, 1819, and educated at Edinburgh Academy and Glasgow University, whence he proceeded as Snell exhibitioner to Balliol College, Oxford. From 1846 to 1856 he was assistant-master at Rugby, then conducted for a few months the Greek classes at Glasgow, was assistant-professor of Latin at St. Andrews from 1857 to 1861, when he was appointed to the professorship, and was elected principal of the United College of St. Salvator and St. Leonard in 1868. From 1877 to his death (at Ormsay in Argyllshire on September 18th, 1885) he was professor of poetry at Oxford. His works include a volume of poems entitled *Kilmahoe* (1864), *Studies in Poetry and Philosophy* (1868), *Culture and Religion* (1870), *Aspects of Poetry* (1881), and *Burns in the English Men of Letters* series (1879), in the last of which he was singularly unhappy in his estimate of the poet.

Of his short pieces, Shairp's "Bush Aboon Traquair" bids fair, as it deserves, to live.

Shakers, the name usually given to the "United Society of Believers in Christ's Second Appearing," a sect founded by Ann Lee (1736-84), a native of Manchester. Jane Wardley, a tailor's wife, who belonged to the Society of Friends, declared she had received a Divine message announcing that Christ's second coming was about to take place, and that He would assume the form of a woman. Ann Lee applied this prophecy to herself, being honoured with a vision of Jesus whilst she was in gaol in 1770 for Sabbath-breaking, and gained a few converts besides Jane Wardley and her husband. They were called Shakers, owing to the extravagant gestures they adopted when engaged in worship. In consequence of the persecution to which they were subjected, Ann sailed with her followers to America in 1774, and formed a settlement at Niskayuna (now Watervliet), near Albany, New York. The headquarters of the society, which adopted communistic ideas, combined with strict celibacy, was afterwards fixed at New Lebanon. The Shaker settlements comprise both men and women, under the direction of an elder and an eldersess. In addition to their own peculiar doctrines regarding marriage and a female incarnation, they share many of the views held by the Quakers. They are a quiet, industrious people, famed for their agricultural skill and their knowledge of medicinal herbs. The English Shakers, or the People of God, owed their origin to Mary Anne Girling (1827-86), who became a prey to the same kind of delusions as Ann Lee. They formed a settlement in the New Forest, where they suffered great privations, but after the death of Mrs. Girling, whom they regarded as immortal, the community was dissolved.

Shakespeare, WILLIAM, poet and dramatist, the world's greatest playwright, was born at Stratford-on-Avon, Warwickshire, England, in April (in all likelihood on April 23 Old Style), 1564. His father, John Shakespeare, a fellmonger and glover, who in 1568 became high-bailiff of Stratford, had married in 1557 Mary Arden, daughter of a well-to-do farmer. William Shakespeare was probably educated at the Stratford free school, where he would have learnt some Latin and possibly the rudiments of Greek. When he was about fourteen years old his father fell into pecuniary troubles. There is a tradition that the boy became a butcher's apprentice; it has been conjectured that he was also for a time in an attorney's office, the legal allusions in his writings being unusually numerous and accurate. At the age of eighteen and a half he was married to Anne Hathaway, daughter of a yeoman of Shottery, in the parish of Stratford; she was eight years older than her husband. A daughter, named Susanna, was baptized on May 26th, 1583. His other children were twins, Hamnet and Judith (baptized February 2nd, 1585); Hamnet died in

his twelfth year; Susanna and Judith survived their father. The tradition that Shakespeare quitted Stratford in consequence of trouble which followed a deer-stealing expedition in the grounds of Sir Thomas Lucy, of Charlote, is probably based on fact. The date is perhaps 1586 or 1587. It is said that his first employment in London



WILLIAM SHAKESPEARE (DROESHOUT'S PORTRAIT).

(Photo : W. Baker, Birmingham.)

was that of holding horses at the theatre door; but the statement cannot be proved. We lose sight of him until 1592, when he is referred to in a hostile spirit, as an actor and playwright, by Robert Greene (1560-92), the dramatist, in the pamphlet *Greene's Groatsworth of Wit*. Henry Chettle, the editor of Greene's deathbed pamphlet, apologizes for the attack, and speaks of Shakespeare's "grace of writing" and "uprightness of dealing." As an actor Shakespeare never became eminent; he is said to have played the ghost in his own *Hamlet*, Old Adam in *As You Like It*, and Old Knowell in Jonson's *Every Man in his Humour*. In 1593 appeared his narrative poem *Venus and Adonis*, dedicated as the "first heir of his invention" to the Earl of Southampton, his friend and patron. It was followed in 1594 by *The Rape of Lucrece*. Both poems were highly popular; the earlier is remarkable for its pictures of country life; the latter for its sympathy with Roman character; the *Venus* is a study of feminine passion and boyish coldness; the *Lucrece* represents wifely chastity and fidelity opposed by the treason and violence of an evil man. Shakespeare's first work

as a dramatic writer (about 1589-90) was probably that of rehandling and fitting to the stage pieces by earlier dramatists. *Titus Andronicus* may have been retouched by him, and it is believed that he made additions (as Act ii. sc. 4) to the *First Part of Henry VI*. In the *Second* and *Third Parts of Henry VI*, he revised the work of Greene and perhaps Christopher Marlowe (1564-93), possibly with Marlowe's assistance. *King Richard III.* shows the influence of Marlowe, though his hand is not present in the work. In the prose passages of the early comedies he was influenced by John Lyly (1553-1606). *Love's Labour's Lost* satirises contemporary affectations of manners and diction. The farcical *Comedy of Errors* illustrates the influence of Plautus on English comedy. The *Two Gentlemen of Verona*, partly derived from a Spanish source, is a play in the romantic manner. This early group of comedies reaches its highest point in *A Midsummer Night's Dream*, where exquisite lyrical writing, broad humour, and chivalric sentiment are delightfully brought together. *King Richard II.* (about 1594), though not unaffected by Marlowe's *Edward II.*, shows how Shakespeare in historical drama was delivering himself from discipleship to Marlowe. *King John* (about 1595), to some extent founded on an older play, stands as regards style midway between Shakespeare's early histories and those of his maturer years—the two parts of *King Henry IV.* (1597-8) and *King Henry V.* (1599), in which there is a great development of comic power. In like manner the *Merchant of Venice* represents the mid-period between the earliest comedies and those which were produced in the closing years of the 16th century. Shakespeare's earliest independent tragedy is the lyrical tragedy of youth and love and death, *Romeo and Juliet*. Its chief source is Arthur Brooke's narrative poem *Romeus and Juliet* (1562), itself derived from an Italian tale by Matteo Bandello (1480-1562). Thus alike in comedy, history, and tragedy Shakespeare was advancing with swift and unfaltering steps. He had learnt all that his dramatic predecessors could teach him, and had formed a style of his own.

Meanwhile, his worldly fortunes prospered. He acted with his company—the Lord Chamberlain's—on several occasions before Queen Elizabeth. In 1597 he purchased New Place, a large house in Stratford, and he seems to have exerted himself to restore his father's fallen fortunes. In 1598 he assisted in negotiating a loan for the Stratford Corporation. He became a shareholder in the Globe Theatre, erected in 1599 on the Southwark side of the Thames near London Bridge. In 1602 he enlarged his New Place property, and bought 107 acres of land near Stratford. Three years later he purchased for £440 the unexpired term of a moiety of the Stratford and neighbouring tithes. But as he advanced in life sorrows came to Shakespeare. His son Hamnet died in 1596; his father in 1601; in 1607 he lost his brother Edmund, an actor; in the following year his mother died. The *Sonnets* published in 1609, but probably written several years previously, tell of an idealising friendship for some unknown youth of high



SHAKESPEARE.

- 1 The Church, Stratford-on-Avon (Poulton & Son, London, phot.). 2 Shakespeare's House (Harvey Barton, Bristol, phot.)
 3 Shakespeare's Monument, Holy Trinity Church, Stratford (Poulton & Son, phot.). 4 Ann Hathaway's Cottage (Harvey Barton, Bristol, phot.).

station, and of an extravagant passion for some unknown lady, highly accomplished but not beautiful in person, upon whom Shakespeare squandered his heart. She would seem to have ensnared Shakespeare's young friend, with the result that the friendship, though afterwards restored, was broken for a time. The *Sonnets* are dedicated by the bookseller to "Mr. W. H." as their "only begetter." Many conjectures have been hazarded as to the identity of Shakespeare's friend; perhaps the least unfortunate is that which suggests that he was William Herbert, Earl of Pembroke. An attempt has been made to identify the lady of the *Sonnets* with Mary Fitton, a maid of honour to the queen. Some critics argue that "Mr. W. H." was Henry Wriothesley, Earl of Southampton; others regard the veiled story of these poems as wholly fanciful; others as an allegory; but it can hardly be doubted that a basis of fact supports what is ideal or imaginative. Shakespeare's brightest comedies lie about the year 1600. *The Merry Wives of Windsor* is said to have been hastily written at the request of Queen Elizabeth, who desired to see Falstaff in love. *The Taming of the Shrew*, somewhat boisterous in its mirth, is founded on an older play. In *Much Ado about Nothing*, founded on a story by Bandello, the mirth is refined, and some matter almost tragic is connected with the humour of the piece. *As You Like It*, based on a novel by Thomas Lodge (1556-1625)—itself derived from the old poem of *Gamelyn*—and *Twelfth Night* bring the development of Elizabethan comedy to its highest point. The gaiety declines in the comedies which immediately succeed; *All's Well that Ends Well* is serious in the presentation of its strong-willed and clear-sighted heroine; *Measure for Measure* is dark and would be painful but for the nobility of the character of Isabella; *Troilus and Cressida*, the date of which is disputed, is a comedy of disillusion, almost cynical in its satire of spurious heroism and the deceptions of passion. At this point Shakespeare turned from comedy to tragedy. *Julius Caesar* (1601) and *Hamlet* (1602) may be described as tragedies rather of reflection than of passion. In the former Shakespeare follows Plutarch; the latter is perhaps based upon an older play. Each represents, in the persons of Brutus and Hamlet, the inefficiency of a thinker and student for dealing with the tragic material of actual life. Tragedies of passion follow. In *Othello* (about 1604) the fatal breach is between husband and wife; in *King Lear* (1605) it is between father and child. *Macbeth* (about 1606), the tragedy of guilty ambition, represents the treason of a subject to the king. In *Antony and Cleopatra* (1607) and *Coriolanus* (1608) the poet again handles Roman history; the one is the tragedy of Roman manhood yielding to the seductions of sensual pleasure; the other is that of Roman pride overthrown by its own excess. The heroine of one play exhibits the voluptuous genius of the East; the heroine of the other is the lofty matron of Rome. This group of plays closes with *Timon of Athens* (about 1607-8), which exhibits the ruin of manhood, caused by pessimistic despair following on an over-lax benevolence. The last group of

Shakespeare's plays is romantic, and, though showing a deep knowledge of human ills, they are radiantly serene in temper. They tell of the knitting again of broken human ties, of the gentleness and wisdom of old age, the joy of unstained youth, the blessedness of the forgiveness of injuries, and the loveliness of meadow and mountain and sea. Probably only a part of *Pericles* (part of Act iii. and all of iv. and v.) comes from Shakespeare's hand. *Cymbeline* combines a fragment of old British legend with matter from Italian romance. *The Tempest* is like a great mage's legacy of wisdom. In *The Winter's Tale* Shakespeare dramatised a novel by his early contemporary Greene. It is now disputed whether any portion of *King Henry VIII.* belongs to Shakespeare; part of the play is undoubtedly by John Fletcher (1579-1625). The authorship of *The Two Noble Kinsmen* is also uncertain; but possibly in it, as in *Henry VIII.*, Fletcher co-operated with Shakespeare. We do not know that Shakespeare appeared as an actor after 1603 or 1604. In 1607 his daughter Susanna married a Stratford physician named Hall. The shares in the Globe Theatre were sold, but Shakespeare, while retiring to his native place, retained a connection with London, having bought in 1613 a house near Blackfriars Theatre. In February, 1616, his daughter Judith married Thomas Quiney, a Stratford vintner. A month later the great poet was seriously ill, and attached his signature to a draft copy of his will. He died on April 23rd, 1616, and his body was laid in the chancel of the parish church. His widow lived until 1623. The only indisputably genuine portraits of Shakespeare are the rudely-executed bust in the church at Stratford and the rude engraving by Droeshout in the first collected text of his plays (1623). In 1907 great interest was aroused by the discovery of a portrait, surmised by Mr. M. H. Spielmann to be that of Shakespeare at the age of twenty-four, which had done duty for an unknown number of years as a signboard in Darlington. The form "Shakespeare" has autograph authority; "Shakespeare" is the form which appears on title-pages of books for the publication of which the poet was responsible. Since general interest attaches to the prices which rare editions of books fetch in the auction-room, it may be mentioned that a superb copy of the first Folio edition of Shakespeare's works, published in 1623, which had belonged to Mr. W. C. van Antwerp of New York, was sold at Sotheby's rooms in London on March 23rd, 1907, for the enormous sum of £3,600—the record price at that date—the purchaser being Mr. Quaritch, the well-known bookseller.

Shakespeare's Cliff, a chalk mass rising sheer from the sea to a height of 350 feet on the coast of the English Channel to the south-west of Dover, not far from the harbour. It is named after the dramatist, from the circumstance that a scene in *King Lear* was laid here. The cliff has been tunnelled for nearly three-quarters of a mile for the railway from Folkestone. Before reaching Dover the metals are carried on a lofty viaduct over a creek. Chalk slips take place occasionally,

there having been an unusually extensive one in 1897. When the project of a Channel tunnel was first broached, a shaft was sunk in this quarter with a view to testing the practicableness of the scheme. Borings for coal have also been made in the vicinity.

Shale, a laminated sedimentary rock, typically argillaceous, but often either sandy, calcareous, carbonaceous, or bituminous. Shales split into very thin laminae parallel with the bedding of the rock. They may be the result of separate acts of intermittent deposition, as in the inundation-mud of the Nile, and are often indications of shallow waters with varying sediments, as in the paper-shales and associated beds of the Penarth (Rhætic) series. They thus frequently mark transitions to pure sandstones or limestones, as in the Ledbury Shales (sandy) below the Old Red Sandstone and the Tuedian (Tweed), or Lower Limestone Shale below the Carboniferous Limestone. Most Palæozoic argillaceous beds are shales, as in the Wenlock and Ludlow Shales, probably the result of the vertical pressure from the weight of superincumbent rock. The roof of most coal-seams is formed of shale (the "slate" that occasionally appears in the coal-scuttle). Bituminous shales, from which paraffin is distilled, as in Lanarkshire, are recognisable by smell, by brown stains on a black surface, and by rolling up when pared.

Shallot (*Allium ascalonicum*), a hardy perennial species of onion, native of Palestine, and especially of the neighbourhood of Ascalon, of which its name is a corruption. It was introduced into England in 1548, and is milder in flavour than the onion. Its bulbs divide into "cloves," as in garlic. They are largely pickled in vinegar.

Shamanism, the religion professed by certain tribes of Finnish stock, such as the Ostiaks, Samoyedes and other races of Northern Siberia. These peoples believe in a Supreme Being, but think that the government of the world has been committed to several subordinate deities, of whom some are well disposed and others inimical towards man and who must be propitiated by magic ceremonies and incantations. They deem that the future life will be considerably worse than the present and therefore they view death with anything but equanimity. Only folk in the most rudimentary stage of civilisation would cherish beliefs of that description. The word *shaman* is Persian and Hindustani for an "idolator," and indicates not only the extensive part which mere sorcery or wizardry plays in such a crude faith, but also the hold which the cunning "medicine-man" has upon his deluded victims.

Shammai, a Jewish rabbi who flourished in the 1st century B.C., and founded a school which entered into rivalry with that of Hillel, though the two contemporaries do not seem to have differed greatly in their doctrines. Shammai interpreted the law in a very literal manner, and enjoined a strict observance of all its ordinances.

Shamrock, a green trefoil leaf serving as the national emblem of Ireland, having been used by

St. Patrick to illustrate the doctrine of the Trinity. The plant in question was probably not the wood-sorrel, which is comparatively uncommon in Ireland, but a true trefoil, such as *Trifolium repens*, *T. filiforme* or *Medicago lupulina*, which are worn indiscriminately in Ireland on St. Patrick's Day.

Shamyl, or SCHAMYL (that is, Samuel), the patriot of the Caucasus, was born in Daghestan about 1797. He became a mollah, or priest, and took the lead in preaching a holy war against the Russian invasion of his country (1831). His patriotic spirit and bravery induced him to take the field, and over and over again he harassed and defeated the enemy, not in pitched battles but in ambuscades. In 1839 General Grabbe surrounded him in the fortress of Achulko. Capture seemed inevitable, but he contrived to escape, and for many years incited the Lesghian, Circassian and other tribes to maintain the guerilla warfare. In 1842 he repulsed the Russians, again under Grabbe, at Itchkeri. Operations against the heroic mountaineer were suspended during the Crimean War, in which Shamyl was able to assist the Allies. After the Treaty of Paris, however, Russia adopted the plan of systematic and ruthless extirpation and by that means ultimately subdued the Caucasus. The Russian forces burned every village as they advanced, and against this policy the tribes were powerless. At last Shamyl's stronghold of Weden was stormed and the chieftain was obliged to flee. Most of the tribes now submitted, but Shamyl still held out. He defended the fortress of Mount Gunib, but it was surprised on October 6th, 1859, and the hero was captured. He was deported to St. Petersburg, and the Tsar allowed him an income and a residence at Kaluga, about 100 miles southwest of Moscow. He was afterwards permitted to live at Kieff. In 1870 he made the pilgrimage to Mecca, where he died in the following year. One of his sons took service in the Russian and another in the Turkish army.

Shanghai, or SHANGHAE, a city and port of China, on the left bank of the Hwang-p'u or Woosung river, 12 miles above its junction with the Yang-tse-Kiang. It covers a great area, and is divided into several sections. The native city is surrounded by a wall $3\frac{1}{2}$ miles in circumference and occupied by close, narrow, dirty streets, which are insanitary to an abominable degree. Between the Chinese city and the river the space is taken up by suburbs, in front of which are crowded the junks at anchor. Immediately to the north of the native city lies the French quarter, where, in sharp contrast, the streets are well constructed, broad, paved and properly lighted. To the north of this district, again, separated from it by the Yanking Canal, is situated the British settlement. It was selected in 1843 and is bounded on the north by the Soochow Creek and on the east by the river, while on the west there begins a vast, fertile, alluvial plain, which extends to more than 40,000 square miles. Within the British region have been erected many handsome houses and imposing buildings, including the Anglican Cathedral, which was designed by Sir Gilbert Scott. On the north side of the Soochow

Creek is laid out the American section, the river at this point making a sharp bend towards the east. Owing to its position, Shanghai, by means of the rivers and innumerable canals converging towards the estuary of the Yang-tze-Kiang, taps the agricultural and industrial wealth of Central China. It is thus the natural outlet for the tea, silks, cotton, woollens, opium, metals and other products of the gardens, fields, plantations and factories of the most fertile and busiest area of the Celestial Empire. By the Treaty of Nanking which followed the war of 1841 Shanghai was recognised as a treaty-port, open to the trade of the world (1842). The growing prosperity of the city was checked for a period by the approach of the Taeping rebels in 1852. They obtained a footing in the native city and by their presence dislocated trade to such an extent that the Chinese Government implored the British, French and American consuls to provide for the collection of the revenue, a system which has worked admirably under Mr. H. N. Lay, Sir Robert Hart and other able administrators. But though the rebels were dislodged in 1855, they returned periodically and caused so much disturbance that at last British, French, and American aid was invoked to suppress them. On March 25th, 1863, General Gordon assumed the command of the Chinese force, which in Oriental fashion dubbed itself the Ever Victorious Army, and, carrying the war into the enemy's country, soon succeeded in crushing the rebellion, the malcontents learning a bitter lesson in the process. It was for his skilful handling of this revolt that he acquired the *sobriquet* of Chinese Gordon. Shanghai is the seat of the British Supreme Court of Appeal for China and Japan, which also adjudicates upon the cases of British subjects in the city. The climate is exceedingly trying. The early winter is enjoyable, but the summer is intensely hot, and fever, dysentery and cholera are rife. Pop. (variously estimated), from 450,000 to 600,000.

Shanklin, a watering-place on the south-east coast of the Isle of Wight, England, 9 miles S. of Ryde. Part of the town lies on the level of the shore and part on the summit of the cliffs. The fine sandy beach and the beauty of its surroundings have brought the place deservedly into favour as a holiday and health resort. There is a chalybeate spring on the front. A portion of the church of St. John the Baptist is said to date from the reign of King Stephen. On one side of Shanklin the sands stretch to Sandown, while on the other there is a charming walk by the Undercliff and Bonchurch to Ventnor. On the west of the town is the ravine known as Shanklin Chine, lovely in the growth of trees, shrubs and ferns which clothe both banks of the chasm carved through the cliffs by the brawling burn. As it reaches the sea the chine is 180 feet wide and 270 feet deep. At the head are several picturesque, thatch-roofed cottages. The town is commanded by Shanklin Down, 773 feet high, which affords pleasant views of the Channel and the island scenery. Pop. (1901), 4,553.

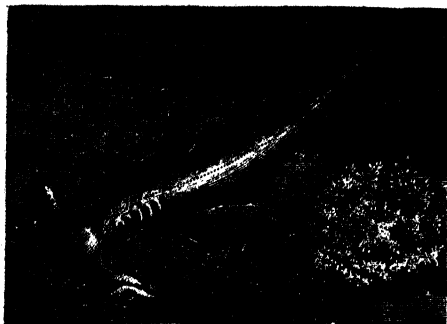
Shannon, the longest river in Ireland. Rising at Shannon Head in Cuileagh Mountain, in County

Cavan, 258 feet above sea level, it pursues a mainly southerly by south-westerly direction till it falls into the Atlantic at Loop Head, after a course of 254 miles. After flowing through County Leitrim, it serves as a boundary to the counties of Roscommon, Longford, Galway, Westmeath, King's County, Clare, Tipperary, Limerick and Kerry, and then separates Connaught from Munster. It has a drainage basin of more than 6,000 square miles, its affluents on the right including the Boyle, Suck and Fergus, and on the left the Rinn, Camlin, Inny, Brosna, Little Brosna, Mulkear, Maigne and Deel. At certain parts of its course it expands into lakes, the principal being Loughs Allen, Boffin, Forbes, Ree and Derg. From its source to Lough Forbes it forms the Upper Shannon, thence to Limerick it is the Middle Shannon and thence to its mouth the Lower Shannon. The tide acts as far up as Limerick, to which point large vessels can ascend, though by means of the lakes steamers can go up to Athlone and smaller vessels to Lough Allen. It communicates with Dublin by the Royal Canal, which joins it near Cloondara in County Longford, and by the Grand Canal, which joins it at Shannon Harbour in King's County. The estuary is 70 miles long and varies in width from 1 mile to 10 miles. The current is sluggish and the country on either side is, on the whole, flat. The chief places on the banks upwards are Kilrush, Foynes, Limerick, Killaloe, Portumna, Banagher, Clonmacnoise, Athlone and Carrick.

Shan States, a territory in Burma, bounded on the N.W. by Upper Burma, on the N.E. by China, on the E. by Laos (French Indo-China), on the S. by Siam and on the W. by Lower and Upper Burma. They occupy an area of 68,165 square miles. The surface is almost wholly mountainous and the chief river is the Salwin. The Shans are people of Chinese origin and are believed to have migrated to this region two thousand years ago. They extend into the valley of the Mekong, are identical with the Laos and akin to the Siamese. They are indolent, addicted to gambling and cock-fighting and pleasure-loving. Buddhism is the prevailing religion. The mineral wealth of their country is considerable, including iron, rubies, silver, gold, coal, copper and petroleum. The principal crops which they cultivate are tea, rice, tobacco and cotton. Pop. (1901), 1,237,749, but there are more Shans outside of the States than within and it is estimated that, including those in Burma, Siam, Anam, Laos and China, their total numbers exceed 5,000,000.

Shark, a common name for a fish belonging to the group Selachoidae, widely distributed, but most numerous between the tropics. The body is long and cylindrical, with a pointed snout, and strong flexible tail, the latter forming an admirable swimming organ. In the place of scales the skin is covered with calcified papillae; the teeth are well developed in most forms, though in some they are adapted for crushing rather than cutting, and these sharks feed only on small fishes or on molluscs and crustaceans. In most the eggs are enclosed in a horny case, though some bring forth the young

alive. In India and China the collecting of sharks' fins is an important industry. They are used for making a thick gelatinous soup. In Ceylon a shark fishery is carried on, and oil is expressed from the



HAMMERHEAD SHARK (*Zygana malleus*).

livers. The skin is also utilised for shagreen. Günther (*Introduction to the Study of Fishes*) recognises the following families:—

CARCHARIIDÆ, chiefly from tropical seas. The Blue Shark (*C. glaucus*) and the White Shark (*C. vulgaris*) attain a length of from 12 to 15 feet and 20 to 25 feet respectively. [DOGFISH, HAMMERHEAD.]

LAMNIDÆ, containing large pelagic forms. To this family belongs the Man-eating Shark (*Carcharodon rondeletii*), which has been known to attain a length of 40 feet. The *Challenger* Expedition obtained from the Ooze teeth similar to but twice as large as those of this species, so that the larger form must have become extinct within recent times. [BASKING SHARK, FOX-SHARK, PORBEAGLE.]

NOTIDANÆ, from tropical and sub-tropical seas. About 15 feet seems to be the greatest length.

SCYLLIIDÆ. [DOGFISH.]

CESTRACIONTIDÆ.—There are four species of a single genus (*Cestracion*). None exceeds 5 feet in length. The teeth are broad and pad-like.

SPINACIDÆ.—Here belong the Spiny Dogfishes [DOGFISH], and the Greenland Shark (*Lamargus borealis*), which grows to a length of about 15 feet, and is a persistent foe of the whale. The Spiny Shark (*Echinorhinus spinosus*), a Mediterranean ground shark, has the skin covered with spiny tubercles.

RHINIDÆ. [ANGEL-FISH.]

PRISTIOPHORIDÆ.—This family contains forms like small sawfishes, but with lateral gill slits, and two long tentacles at the base of the saw.

"Couch says," writes Emma Phipson in *The Animal - Lore of Shakespeare's Time*, "that the notion that the shark, while ferocious in the extreme to every other living creature, yet exhibited great devotion to its young, and watched over them with tender solicitude, is derived from the Greek poet Oppian, who relates that, when danger threatens,

the parent shark opens her mouth and conceals her young ones in the large concave space provided for the purpose, much in the same way as the adder is said to provide for the safety of its offspring. This statement is repeated and confirmed by Rondeletius, a naturalist of eminence, whose work on fishes was the chief authority of this period."

Sharon, a plain of Palestine extending on the coast from the Nahr-er-Zerka southwards for 44 miles to the Nahr Rubin, by which and the hills of Ramleh (756 feet highest point) it is divided from the Philistian plain of Shephelah. It is an undulating country, is in parts well wooded and was once famous for its vegetation and pasture and must formerly have contained splendid oak groves. The most southerly tract is cultivated and, in spring, as viewed from the heights, the landscape is most attractive in its gay dress of brilliant flowers and rich grass. The marshy lands in the north wear a pleasant look in autumn when the tall and graceful papyrus is in flower. But for the intruding sand the plain would yet yield rich crops and feed large flocks.

Sharp, GRANVILLE, emancipator of the slaves, was born at Durham, England, on November 10th, 1735, and educated at Durham Grammar School. He was apprenticed to a linen-draper in London, but in 1758 obtained a situation in the Ordnance Department. In the meantime he had acquired Greek and Hebrew and in 1767 published a *Short Treatise on the English Tongue*. He was offered a living in Nottinghamshire, but could not see his way to take holy orders. Two years before he had befriended a homeless negro named Jonathan Strong. In 1767 the master sued Sharp for illegal detention of his property and, when the latter found the leading lawyers of the day against him, he devoted two years to investigating the law of personal liberty in England. His research resulted in the publication (1769) of *A Representation of the Injustice . . . of tolerating Slavery* and he took up several cases, including the famous case of James Somerset in which he gained a verdict for humanity, the judges affirming the principle that "as soon as any slave sets his foot upon English territory, he becomes free." Sharp sympathized with the American colonists who declined to be taxed unless they were represented and threw up his Ordnance post rather than despatch war material to the States (1776). He assisted General Oglethorpe in his crusade against the pressgang and was instrumental in introducing Episcopacy into New England after the war in 1787. In the same year he founded the Society for the Abolition of Slavery and advocated the formation of the Crown colony of Sierra Leone for freed slaves, the first company of whom were despatched thither on April 8th, 1787. He assisted to found the British and Foreign Bible Society and was its first chairman in 1804, and was also one of the founders of the Society for the Conversion of the Jews in 1808 and first chairman of the Protestant Union in 1813. He died at Fulham on July 6th, 1813.

Sharp, JAMES, Archbishop of St. Andrews, was born in the castle of Banff, Scotland, his father being factor to the Earl of Findlater, on May 4th, 1613. He was educated at King's College, Aberdeen, and seems also to have studied at Oxford. He became Professor of Philosophy at St. Andrews about 1644 and in 1650 was elected one of the ministers of Edinburgh, a call which Cromwell's invasion prevented him from accepting. During the Commonwealth he supported the "Resolutions" against the "Protesters," or extreme party, in the Kirk, but when sent on a mission to Charles at Breda (1660) he made use of the opportunity to intrigue with the prince and Clarendon. After the Restoration he secretly aided the establishment of Episcopacy in Scotland, receiving as his reward the Archbishopric of St. Andrews (1661). By this step, as well as his subsequent conduct, he earned the hatred and scorn of the Covenanters. On the 3rd of May, 1679, whilst he was returning to St. Andrews with his daughter, he was attacked and murdered by twelve men, under John Balfour of Burleigh, on a lonely spot called Magus Muir, between the city and Cupar. The assassins escaped to the west of Scotland and the episode, along with the Covenanters' rebellion, was dealt with at length in Sir Walter Scott's *Old Mortality*. An elaborate marble monument was erected to Archbishop Sharp in the parish church of St. Andrews in which he was buried.

Sharp, RICHARD, "Conversation Sharp," was born in Newfoundland in 1759. He adopted a mercantile career in London, first in the West Indian trade and afterwards as a hat manufacturer and amassed a fortune. He took a strong interest in politics and literature and rejoiced in the society of literary men. He knew Dr. Johnson and Edmund Burke, became the lifelong friend of Samuel Rogers, and was a member of most of the literary Bohemian clubs. He was elected F.S.A. in 1787 and F.R.S. in 1806. From this year to 1812 he sat as M.P. for Castle Rising in Norfolk, was returned for Portarlington in 1816 and retired in 1819 to make room for David Ricardo. At his house in Park Lane and his cottage at Mickleham, near Dorking, he constantly collected the sociable notabilities of the day and it was in consequence of the part which he played at these gatherings that he obtained his nickname. Among the regular visitors were James Mill, Francis Horner, Henry Grattan, Sydney Smith (there so often that he was styled "the bishop of Mickleham"), Tom Moore, John Horne Tooke, Lord Macaulay (not then a peer) and many other distinguished persons. He died at Dorchester on March 30th, 1835. In 1823 he published anonymously *Epistles in Verse*, which were reproduced with additions in *Letters and Essays in Prose and Verse* (1834).

Sharp, WILLIAM, pseudonym "Fiona Macleod," man of letters, was born in Glasgow on September 12th, 1856, and educated at the university of his native city. Poor health compelled him to spend much of his youth in travel, chiefly in Australia and the Pacific, but he settled in London in 1879 and, through the kind offices of Sir Noel Paton,

came to know Dante Gabriel Rossetti and his circle. He soon showed extraordinary facility and industry in several branches of literature and maintained the amazing output until his death at Bronte, Sicily, on December 12th, 1905. In poetry he produced *The Human Inheritance* (1882), *Earth's Voices* (1884), *Romantic Ballads* (1886), *Sospiri di Roma* (1891) and *Sospiri d'Italia* (1904); in biography he wrote *Dante Gabriel Rossetti* (1888), besides studies of *Shelley*, *Heine*, *Browning* and *The Severn Memoirs*; among his novels were *Children of To-morrow* (1890), *Madge o' the Pool*, *Wives in Exile* and *A London Romance*; works in belles-lettres comprised *Vistas*, *Ecce Puella* and *A Literary Geography* (1904), while he edited *The Sonnets of the 19th Century* and *Lyra Celtica*. His identity with "Fiona Macleod" was not disclosed till his death and was thus a well-kept secret. Under this name he produced several works, amongst them being *Pharais* (1894), *The Mountain Lovers* (1895), *The Sin-Eater* (1895), *The Washer of the Ford* (1896), *Green Fire* (1896), *The Laughter of Peterkin* and *Old Celtic Tales Retold* (1897), *The Dominion of Dreams* (1899) and *Iona* (1900).

Sharpe, CHARLES KIRKPATRICK, antiquary and artist, was born at Hoddam, Dumfriesshire, Scotland, about 1781, and educated at Christ Church, Oxford. He was a man of curious temperament, crotchety and "gey ill to deal wi'," but extremely affable with those he took to. Making a speciality of antiquity he read assiduously and edited several rare works for the Bannatyne and other clubs. On the appearance of Sir Walter Scott's *Minstrelsy of the Scottish Border* in 1802, he manifested a keen interest in the project, contributing ballads of his own and forming a lifelong friendship with Scott. In 1807 he published *Metrical Legends and other Poems*, but he showed more skill with his pencil, especially in the line of the grotesque and caricature, than he did in verse-making and brought out, in 1833, a volume of etchings under the title *Portraits of an Amateur*. His *Etchings, with Photographs from Original Drawings, Poetical and Prose Fragments* appeared posthumously in 1869. He was an indefatigable collector of Scottish curios and antiques and many of his "finds" are now at Abbotsford. He died at Edinburgh on March 17th, 1854.

Sharpe, SAMUEL, Egyptologist, was born in London on March 8th, 1799, and was educated at Eliezer Cogan's school at Walthamstow, which Benjamin Disraeli also attended. He entered the bank of his uncle, Samuel Rogers, the poet, in 1814, became a partner in 1824, and remained with the concern till 1861. Having acquired an interest in Egyptology he learned Coptic and formed a vocabulary of hieroglyphics, in compiling which he acted upon the bold generalisation, "Granted a sentence in which most of the words are already known, required the meaning of others." In 1836 he published *The Early History of Egypt* and in the following year appeared the first part of his *Egyptian Inscriptions* (others were issued in 1841, 1855) and his *Vocabulary of Hieroglyphics*. In 1846 he blended several of his sectional works

into one complete *History of Egypt*. In 1840 he published *The New Testament, Translated*, working upon the text of Griesbach, and his translation of *The Hebrew Scriptures* came out in 1865. In 1869 his *History of the Hebrew Nation and Its Literature* appeared. He was President of the British and Foreign Unitarian Association in 1869-70 and President of Manchester College (now at Oxford) in 1876-8. He died in London on July 28th, 1881.

Shaw, GEORGE BERNARD, playwright and critic, was born at Dublin on July 26th, 1856. He came to London in 1876. His early years were occupied with agitation in the cause of Socialism and with criticism of the Fine Arts. In 1884 he joined the Fabian Society, of which he became a prominent member and for which he edited the *Fabian Essays* in 1889, contributing two of their number. The society also published many of his tracts on Socialism. In 1891 appeared his *Quintessence of Ibsenism* and in the following year *The Perfect Wagnerite*. From 1888 to 1890 he wrote weekly articles on music for the *Star* under the pseudonym of *Corno di Bassetto*; afterwards writing similar articles for *The World* from 1890 to 1894. In 1895 he joined the *Saturday Review* as dramatic critic and continued in that capacity until 1898. In 1898 he published his *Plays: Pleasant and Unpleasant*, a collection of seven plays, of which the first—*Widowers' Houses*—was originally begun in collaboration with William Archer in 1885, and performed by the Independent Theatre Company at the Royalty Theatre, London. *Arms and the Man*, another of these plays, was performed at the Avenue Theatre, London, and in the United States. *Candida*, perhaps the best of the seven plays, was written in 1896 and performed by the Independent Theatre Company and again in 1904 in New York. The remaining four plays of this set are *The Philanderer*, written in 1893; *Mrs. Warren's Profession*, performed in New York in 1905, when it created a sensation; *You Never Can Tell*, written in 1896, and *The Man of Destiny*, written in 1895 and performed at Croydon in 1897. In 1900 he published *Three Plays for Puritans*, which consisted of *The Devil's Disciple*, written in 1897 and performed in New York in the same year, *Cæsar and Cleopatra*, written in 1898, and *Captain Brassbound's Conversion*. Of his later plays the best known are *The Admirable Bashville*, or *Constancy Rewarded*, performed at the Imperial Theatre by the Stage Society in 1903; *Man and Superman*, written in 1902, published in 1903 and produced at the Court Theatre by Granville Barker in 1905; *John Bull's Other Island*, performed by the Stage Society at the Court Theatre in 1904; *Major Barbara*, in which Shaw deals with the Salvation Army, was written in 1905 and produced at the Court Theatre, as was also *The Doctor's Dilemma*. He has also written "The Commonsense of Municipal Trading" (1904) and "Fabianism and the Fiscal Question" (1904). A man of strongly marked character and advanced opinions, he is opposed to vaccination and vivisection, is an ardent vegetarian, clothes himself à la Jaeger and politically, like his countrymen, is often "agin the Government."

Shawl (Persian, *shāl*), a square or oblong garment worn so as to hang from the shoulders. In the East, where its use dates back to a remote period, it is worn both loose and woven into tunics and other shaped articles. The most beautiful and costliest shawls are those made in Kashmir. The material of Kashmir shawls, called "pashm" or "pashmina," is the fine short under-wool of the shawl-goat indigenous to the highlands of Tibet. These shawls are either woven at the loom or embroidered; in the former case they usually consist of small segments joined together with so much neatness that they present the appearance of a single piece; the embroidered shawls have an intricate design worked with the needle in pashmina thread on a plain ground of the same material. The processes of sorting the wool, spinning, dyeing, and weaving or embroidering, all require great care and occupy much time. The main feature in the designs on Kashmir shawls, the artistic value of which is fully recognised, is the "cone" pattern, traced by some experts to the image of a cypress bent by the wind. These shawls are also prized for the harmony, depth, richness, and durability of their colours. An inferior kind of shawl, in which the pashm is mingled with "koork" (goat's wool from Kerman, in Persia), is manufactured by settlers from Kashmir in various towns of the Punjab. The genuine Persian shawls are made of silk, and rank second to those of Kashmir alone. The manufacture of imitation shawls which formerly thrived at Lyons, Norwich, Paisley, and elsewhere, has now greatly declined, or become altogether extinct, and it is said that even in Persia European broadcloth is to some extent superseding the native shawl-stuff.

Shawnees, North American aborigines, members of the Algonquian family, formerly very powerful on the eastern slopes of the Alleghanies, in the Susquehanna basin, and as far as the Delaware. The famous chief Tecumseh, who endeavoured to rally the Indians against the whites in 1811, was a Shawnee. After his defeat by General Harrison at Tippecanoe, the nation was driven beyond the Mississippi, and was later removed to the Quapaw, Sac and Fox, and Cherokee reserves in Indian Territory. Here the various groups still number 1,560.

Shearwater, a bird belonging to the genus *Puffinus*, of the Petrel family, with about twenty species, universally distributed. The wings are long and pointed; the nostrils open separately; the three front toes are webbed, and the hind toe is very small. All the species are oceanic, and swim well, though they rarely dive, feeding on fishes that frequent the surface. Some are nocturnal in habit, or partially so. Four species visit the British Isles: the Great Shearwater (*P. major*) is generally met with on the south coast of England, the Dusky Shearwater (*P. griseus*) has been taken there, and also on the east coast; the Dusky Shearwater (*P. obscurus*) is but an occasional visitor. The Manx Shearwater (*P. anglorum*), by far the commonest, is about the size of a pigeon, black above and white below. It breeds in Wales and in the Orkneys. All

these birds lay a single white egg in a hole in the ground.

Sheba, the country whose queen, according to the Bible narrative (1 Kings x.; 2 Chronicles ix.), visited Solomon, is usually supposed to be Yemen, in the south-west of Arabia. Its capital was Saba, the present Mareb, now practically ruinous. James Bruce, the traveller, however, argued that Sheba was situated on the coast of Abyssinia, towards the southern end of the Red Sea. He did not derive the name from the son or grandson of Cush (Genesis x. 7), but said that it meant "south," recalling the description of the queen in Luke xi. 31 as "the queen of the south." Both countries yielded spices, incense, and gold, and the journey to Jerusalem was equally arduous from either. The Abyssinian tradition supports this contention. It is believed that she stayed long enough in Palestine not only to study the Hebrew religion and the Solomonic mode of government, but also to bear a son to Solomon, who was afterwards sent to Jerusalem to be educated, brought back with him to Abyssinia (Ethiopia) a number of Jewish colonists and finally succeeded his mother on the throne. That the Queen of Sheba made a protracted stay in Judæa is affirmed by Moslem tradition, according to which Solomon built for her Baalbek as a residence. Dr. John Kitto ingeniously suggested that, since Bruce surmised that the Arabian and Ethiopian coasts at this part of the Red Sea at one time constituted one dominion, the Queen of Sheba may have been queen of both the Sabea of Ethiopia and that of Arabia.

Sheboygan, capital of a county and at the mouth of a river of the same name, Wisconsin, United States, on Lake Michigan, 52 miles N. of Milwaukee. It has an excellent harbour which does a great export trade in the grain of the rich surrounding agricultural land. The manufactures include ironware, stoneware, leather, implements, shoes, furniture, and beer, besides iron-founding and planing mills. Pop. (1900), 22,962.

Shechem. [NABLUS.]

Shee, SIR MARTIN ARCHER, painter, was born in Dublin on December 23rd, 1770. He studied and for a period practised art in his native city, but came to London in 1788 and attended the Royal Academy Schools. He enjoyed the friendship of Edmund Burke and Sir Joshua Reynolds. His urbane manners and genial disposition recommended him, in spite of mediocre talent, and he soon acquired a lucrative connection. He was elected an Associate of the Royal Academy in 1798, and became a full member in 1800. He occupied George Romney's house in Cavendish Square, and probably thereby tacitly suggested that he was his successor. It was an era of strong portrait-painters, however, and he was manifestly inferior to Raeburn, Hoppner, Phillips, and even to Jackson and Sir Thomas Lawrence. Shee had a turn for verse, and in 1805 and 1809 published *Rhymes on Art*, which Lord Byron puffed, following it up in 1814 with *The Commemoration of Sir Joshua Reynolds and other Poems*. Although accepted for Covent Garden, his tragedy

of *Alasoo* did not pass the censor, George Colman the younger, who blundered egregiously, and Shee, who felt the indignity keenly, published it in 1824. On the death of Lawrence in 1830 Shee was elected President of the Royal Academy and knighted. This position he filled, with great acceptance to his colleagues, till his death in Brighton on August 18th, 1850.

Sheep, an animal belonging to the genus (*Ovis*) of Hollow-horned Ruminants, closely allied to the goats, from which they are distinguished by their convex spiral horns, beardless chin, the presence of sub-orbital glands and tear-pits, and of foot-glands in the hind as well as in the fore feet. Neither canine nor upper incisor teeth are present. The male is called a ram, the female a ewe; the young are lambs, and their flesh is lamb; that of sheep is mutton. There are about a dozen species, chiefly Palearctic, but ranging into the neighbouring parts of the Oriental region, and the Rocky Mountain Sheep is American. Central Asia is the chief home of Wild Sheep [ARGALI], whence they range to Northern India, eastwards to Tibet, westwards to Asia Minor, and northwards to Kamtchatka. There is one African species, the Aouda, or Barbary Sheep. Europe has two:—the Mouflon (*O. musimon*) from Corsica and Sardinia, and *O. ophion*, almost extinct, from Cyprus. All frequent high and rocky ground, and are gregarious, a habit which subsists in the domestic species. The flocks are generally composed of females and young males, the older males usually living apart at a higher elevation. While the flock is feeding, sentinels are posted, and these give notice of the approach of danger by a sharp whistling sound, and then safety is sought in flight. At certain seasons desperate encounters take place between the males, which fight, as do those of the domestic species, by butting with the head. An old ram is a match for almost any dog. It has been suggested that a dog which had developed the bad habit of worrying sheep should be shut up in a loose box with a sturdy ram, and that a few days of such confinement would probably cure him of any taste for mutton. No doubt the plan would answer except in the case of a bulldog, which would pin the ram by the nose and so prevent its butting. The common sheep (*O. aries*) was probably the first animal domesticated by pastoral man, and its origin is as obscure as that of the dog. We find it mentioned, however, in the oldest literature that has come down to us; and the story of Cain and Abel—the tiller of the ground and the keeper of sheep—deals with an early stage of human culture. The sheep has been introduced from Europe into America and Australia, where they number millions on the runs, and is now found wherever farming is carried on, though it attains its best development of flesh and fleece in the temperate regions of both hemispheres. In the wild sheep there is a short underwool beneath the straight hairy coat, though this generally is as rough on the surface as the wool itself and consequently felts. In the domestic sheep the outer clothing of hair is lost, and the underclothing of wool greatly developed. This is

shorn yearly, generally in early summer, though the operation may be deferred till the middle of July, and in the autumn "dips" are applied to keep the sheep from parasites and promote the growth of the wool. In countries like Australia and New Zealand, where they are kept on a scale quite imposing in its magnitude, the wool is of as much value, economically, as the carcass, and the sheds are equipped with the Moffat-Virtue and other sheep-shearing machines, so that enormous numbers of fleeces can be stripped with as little delay as possible. Sheep, like other domestic animals, have varied greatly. In the Highland and smaller Welsh Black-faced sheep both sexes bear horns, as do the Dorset sheep, though in the last-named breed the horns are small. In the Merinos, noted for their fleece, only the rams are horned. Most of the English breeds are hornless. In the Iceland sheep as many as eight horns are sometimes developed. An Asian breed, found also in Africa, has the tail greatly enlarged by fat, so it often weighs from 70 to 80 lbs., and is supported by a kind of sledge; while in a Tatar breed the tendency to lay on fat is confined to the rump. The economic value of sheep is very great; their flesh serves for food; their fleeces are made into clothing; their skin into leather for bookbinding and gloves; cheese (*e.g.*, the well-known "Roquefort") is manufactured in some countries from ewe-milk; the fat is melted into tallow; from the intestines "catgut" is made; and horns, hoofs, and bones are also used. In England in the olden days the farmer constantly grumbled at the monopoly of attention which the sheep enjoyed. "They have driven husbandry out of the country," says the *Harleian Miscellany*, "by the which was increased before all kinde of victuals, and now all together sheepe, sheepe, sheepe. It was farre better when there were not onely sheepe yough, but also oxen, kine, swyn, pig, goose, and capon, egges, butter, and cheese; yea, and breade corne, and malt corne yough besides, reared altogether upon the same lande." And in Warwickshire, according to Thomas Fuller's *Worthies*, the complaint was that sheep were "cannibals, eating up men, houses and towns; their pastures make such depopulation." To-day such a condition of things seems as remote as the Deluge.

Sheep-Dog, a somewhat loose name for dogs used by shepherds and drovers. In Scotland the collie is the sheep-dog; in England this breed is replaced by one more stoutly built and with a stiffer coat, probably due to an infusion of mastiff blood. Other varieties of dogs are also employed which, after the necessary practical training, develop a high degree of intelligence and tact. The Bob-tailed Sheep-dog, with grey curly coat, is sufficiently defined by its name.

Sheepshanks, JOHN, patron of art, was born in Leeds, Yorkshire, in 1787 and became a partner in the firm of his father, a cloth manufacturer. He developed a taste for collecting pictures and latterly confined his attention to works by modern British painters. In 1857 he presented his collection to the nation. It contained several of Sir Edwin Landseer's finest works, as well as noble

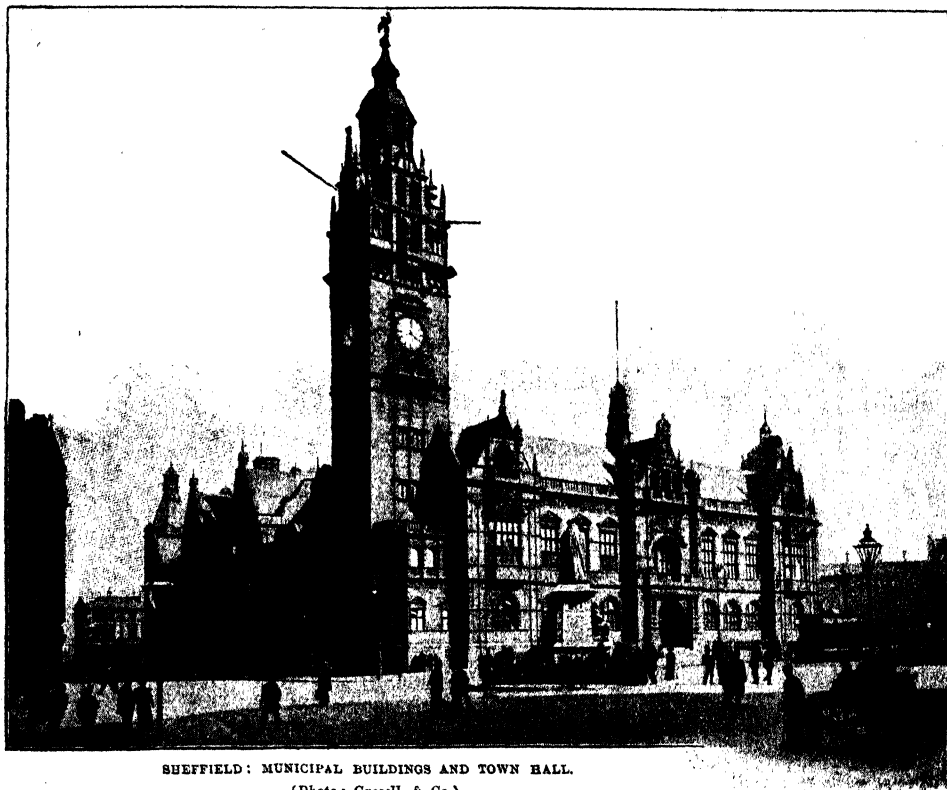
examples of Turner, Linnell, Constable, Mulready, C. R. Leslie, David Roberts, Stanfield, Sir David Wilkie, Creswick, Bonington, Old Crome, and Patrick Nasmyth. His gift was as disinterested as generous, for he neither stipulated that the collection was to be kept intact, nor exhibited as a whole, nor required to bear his name, although he expressed a hope that it might be on view on Sundays. He died in London on October 5th, 1863.

Sheerness, a seaport and naval station at the north-western extremity of the Isle of Sheppey, Kent, 38 miles E. by S. of London, at the point of junction between the Medway and the Thames. Here a fort was built after the Restoration, but was taken by De Ruyter in 1667. The town is now strongly fortified with guns of heavy calibre, since it is the centre of the defence of the entrance to the Thames and Medway. The dockyard has first-rate docks, basins, and all the latest appliances of a naval establishment of the second class, Sheerness being associated with Chatham, higher up the Medway, in respect of the Royal Navy. The barracks will accommodate more than 1,500 men. The dockyard church, built by the Admiralty in 1830, was burned in 1881 and rebuilt and opened in 1885. The wharfage is on the Medway front, but on the Thames front a newer residential quarter has gradually grown up, and, under the name of Sheerness-on-Sea, has become a midsummer resort largely favoured by the masses. Pop. (1901) 18,273.

Sheffield, a city of Yorkshire, England, on the Don, and its tributaries the Sheaf, Porter, Rivelin and other rivulets, 43 miles S.W. of York. Excepting Leeds, it is the largest city in the county, and in 1897 its chief magistrat was promoted Lord Mayor. It is situated in a hilly district and has picturesque surroundings. As far back as the Roman period iron was smelted here, and at the Norman Conquest it was the capital of Hallamshire, an ancient lordship. At that period Richard de Bush was the superior and from him the land passed successively to the Lovetots (at the end of the 11th century), the Furnivals (in the reign of Richard I.), John Talbot, 1st Earl of Shrewsbury (in 1406), and 1654 to the Duke of Norfolk, who is still lord of the manor. In 1530 Cardinal Wolsey spent several days at the castle which, from 1572 to 1586, harboured as a prisoner Mary, Queen of Scots. In 1644 the stronghold was captured by the Roundheads and four years later it was dismantled, its site now only living in certain street names. In 1864 the bursting of the water dam at Bradfield destroyed 250 lives and an enormous amount of property, and three years later the town passed under a cloud in connection with the outrages known as "rattening." Sheffield is well provided with public parks. Norfolk Park, in the south-east of the city, belongs to the Duke who has allowed the citizens the user; Weston Park, in the west, contains the Mappin Art Gallery, museum, observatory and the statue

of Ebenezer Elliott, the Corn Law Rhymer; Firth Park, in the north, is named after Mark Firth, the donor; Meersbrook Park, in the south, contains the St. George's Museum,

boroughs to adopt the Public Libraries Act. The city is rich in educational institutions, among them being Firth College, founded by Mark Firth in 1879 and incorporated as Uni-



SHEFFIELD: MUNICIPAL BUILDINGS AND TOWN HALL.

(Photo: Cassell & Co.)

founded by John Ruskin, a picturesque ravine and fine rose garden and avenues; while the Botanical Gardens, in the west, Endcliffe Woods to the south-west, and Wharcliffe Chase, a magnificent tract of rocky woodland, about 5 miles to the west, are at the disposal of the townsfolk under conditions, and Wharcliffe Lane Cricket Ground is associated with many of the cricketing triumphs of Yorkshire. The principal buildings are St. Peter's Church, dating from the 12th century and containing numerous interesting monuments; the splendid Municipal Buildings opened in 1897 by Queen Victoria; Albert Hall; Cutlers' Hall, containing the offices of the Company and a banquetting hall where important political announcements occasionally accentuate the Cutlers' Feast; the Norfolk and Fitzalan Market Halls; the Corn Exchange and the Central Library, established in 1855, with several branches, Sheffield having been one of the earliest

versity College in 1897; the Royal Grammar School in Broomhall Park; the Technical School, one of the best in the kingdom; the School of Art; Wesley College; the Methodist New Connexion College; the Church of England Educational Institute; the Mechanics' Institution; the Athenæum and the Literary and Philosophical Society. Amongst benevolent institutions are the infirmary, public hospital, Jessop Hospital for women, several hospitals for special diseases, retreats for the infirm, and the Shrewsbury Hospital, Firth almshouses and other acceptable charities. Since the time of Chaucer Sheffield has been the chief seat of the cutlery trade, and the Cutlers' Company was incorporated in 1624. In later years the manufacture of heavier steel goods has been developed, and armour-plates, shot and shell, castings for engines, rails, etc., are turned out in large quantities. Stoves, grates, plated goods, and optical instruments are important products.

The use of cast steel dates from 1740, when it was introduced by Benjamin Huntsman of Handsworth; silver-plating, one of the specialties of the city, dates from 1742, when it was discovered by Thomas Bolsover; the manufacture of Britannia metal ware dates from about 1750; while Sir Henry Bessemer had many converters in blast in the Sheffield foundries. Pop. (1901), 380,717.

Sheil, RICHARD LALOR, dramatist and politician, was born at Drumdowney, County Tipperary, Ireland, on August 17th, 1791, his father being a wealthy Cadiz merchant, and educated at Stonyhurst and Trinity College, Dublin. He was called to the Irish bar in 1814, but supported himself mainly by literature, writing several tragedies—amongst them *The Apostate* (successfully produced at Covent Garden in 1817, with Young, Macready, Kemble and Miss O'Neill in the principal parts), *Bellamira, or the Fall of Tunis* (1818), *Evadne* (1819), *Montoni* (1820), and *The Huguenot* (1822)—and contributing "Sketches of the Irish Bar" to the *New Monthly Magazine* (1822). The foundation of the Catholic Association in 1823 opened a new career for him, and when it was suppressed (1825) he devoted himself with energy to the organisation of the society which took its place. By means of his impassioned oratory he gained a position in the movement second to that of Daniel O'Connell alone. He eventually joined O'Connell in his demand for Repeal, although after Catholic emancipation (1829) he had discountenanced further agitation. In 1831 he was elected M.P. for County Louth, and in 1833 for Tipperary County. After the final defeat of the Repeal party in 1834 Sheil acted with the Whigs, and in 1839 he was made Vice-President of the Board of Trade. He became M.P. for Dungarvan in 1841 and in 1846 was appointed Master of the Mint. The omission of the legend "Defensatrix Fidei Dei Gratia" from the florin issued in 1850 brought him into sharp conflict with public opinion and Parliament, though he disclaimed sectarian motives and the matter was probably a regrettable oversight. He accepted the post of British Minister at the Court of Tuscany in 1850 and died at Florence on May 25th, 1851.

Shekel, originally a Jewish weight, and afterwards a gold and silver coin adapted in some manner to the purposes of exchange, although it bore no impression. The Hebrew talent (*kikkar*) contained 60 maneh, and there were 50 shekels in a maneh. The Maccabees were the first Jewish rulers to issue money in the strict sense of the word. Their silver shekels were probably first coined in 141 B.C. by Simon Maccabæus, weighed about 220 grains troy, and were worth a little more than two shillings. The obverse represented a pot of manna or a sacred vessel with the wording "Shekel of Israel," the reverse a floral device, conjectured to be Aaron's rod budding, and the legend "Jerusalem the holy."

Shelburne, WILLIAM PETTY, 1ST MARQUIS OF LANSDOWNE, better known as LORD SHELBURNE, statesman, was born at Dublin on May 20th, 1737. He was descended on the side of his father, the 1st Earl of Shelburne, from the ancient Irish family of Fitzmaurice, and through his mother from the celebrated Sir William Petty. He was educated privately and at Christ Church, Oxford. After serving in the army he entered Parliament as member for High Wycombe (1760), but his father dying in the following year he never actually sat in the House of Commons. He at first supported Bute, but subsequently joined the Opposition under the elder Pitt, and, after the fall of the Rockingham Ministry, was made Secretary of State. This office he retained till 1768. He vigorously opposed Lord North's policy in regard both to John Wilkes and the American colonies, and on his retirement (1782) accepted the office of Home Secretary in the second Rockingham Administration. Shelburne succeeded the Marquis of Rockingham as Prime Minister, but he was deserted by Fox, who united with North to form the Coalition, and, after seven months' tenure of power, he was forced to resign. In 1784 he was made Marquis of Lansdowne. During the remainder of his life he took little part in politics, and died in London on May 7th, 1805. He was one of the most unpopular statesmen of the time, being accused of insincerity and disloyalty to his comrades. He was deficient in tact and the knack of managing men, but seems to have been a politician of independent views and to have had the courage to prefer measures before men. He was a keen debater and fine orator, and amongst the earliest and most zealous advocates of Free Trade. He was besides a warm and enlightened patron of literature and the fine arts.

Sheldrake, a bird belonging to the genus *Tadorna*, of the Duck family, with seven species, from the Palearctic and Australian regions. The hind toe is free, and in the male there is a frontal knob at the base of the bill. The Common Sheldrake (*T. cornuta* or *vulpanser*) is one of the most beautiful of the family. The head and neck are dark glossy green; this colouring is separated by a white collar from a broad band of bright bay, and the rest of the plumage is black and white, with some grey. The speculum is a rich bronze-green. The male is about two feet long; the female is somewhat smaller, and has the colour less brilliant. It is found on sandy coasts in Great Britain, and usually nests in a rabbit-hole, whence its local name of the Burrow-duck. The Ruddy Sheldrake (*T. rutila*) is a rare visitor to the British Isles.

Shell, a hollow projectile within which is placed a bursting-charge of gunpowder or other explosive material, furnished with a fuse to ignite it at the moment desired. Shells are said to have been first employed by the Sultan of Gujerat in the latter part of the 15th cen-

tury. They are commonly made of cast-iron or steel. The original type, which survives in the common shell, was spherical, being fired from a mortar or smooth-bore cannon, and was invariably filled with powder. Shrapnel shells, invented by Colonel Henry Shrapnel, R.A. (1761-1842), are filled with bullets and a small bursting-charge of sufficient power to split the shell without impeding the flight of the bullets, which then spread over a wide area, their speed remaining unaltered. The Shrapnel shell, being now used for rifle guns, is elongated in form. Palliser shells, invented by Sir William Palliser (1830-82), have sharp-pointed heads which are almost solid, and become chilled by being cast in iron moulds, the result being that their hardness enables them to pierce ships' armour to a very great depth; the explosion takes place without the use of fuses.

Shellac. [LAC.]

Shelley, MARY WOLLSTONECRAFT, novelist, daughter of William Godwin, political philosopher, and his wife, Mary Wollstonecraft, was born in Somers Town, London, on August 30th, 1797. Her mother, a brave and remarkable woman, authoress of the *Vindication of the Rights of Woman*, which initiated many reforms in social life and whose views have largely been realised, died soon after her birth. Godwin remarried a widow, Mrs. Clairmont, a commonplace woman, who inspired no affection in the motherless child. He superintended her education and, despite a cold exterior, became Mary's companion. As she grew up, her mother's memory was idolised by her. Her love for literature, the intellectual friends of her father (Charles Lamb among others), and desire for knowledge helped in the development of her bold and active mind. In 1812 and again in 1814 she met Percy Bysshe Shelley, who was both her needy father's benefactor and disciple. The estrangement between the poet and his wife had then reached an acute stage. Mary Godwin and he were mutually drawn to each other and their affection rapidly ripened. Godwin forbade Shelley his house and Mary, believing in Harriet Shelley's faithlessness, left home with her step-sister Jane (henceforth called Claire) Clairmont on July 28th, 1814, meeting Shelley at five o'clock in the morning near Hatton Garden. They went to Dover and finding the packet gone crossed the Channel in a sailing boat. Mary's literary life now started. Their adventures are recorded in her *History of a Six Weeks' Tour*. They returned to England and in February, 1815, a girl was born to them who died in March, and, in the same year, on the death of Shelley's grandfather his circumstances improved. He then settled £200 a year on his wife. In January, 1816, a son, William, was born, and in May, accompanied by Claire, they again went to Switzerland, where they met Lord Byron. During this visit it was proposed that each of them should write a tale of horror and the celebrated

Frankenstein was the outcome of Mary's listening to a talk between the poets on the re-animation of a corpse. The story of the student (whose name is often misquoted for the monster he created) who discovered the principle of life and determined to create a being superior to man, which drove its creator to the verge of madness and to death, is an extraordinary and not very healthy production for a girl of nineteen. On December 10th Shelley's wife was found drowned in tragic circumstances, and on the 30th he married Mary at St. Mildred's Church, in the City of London. In 1817 a second daughter, Clara, was born, who died in 1818. To the deep grief of his parents William died in Rome, on June 7th, 1819, and the cloud of sorrow was only lifted when, on the following November 12th, their second son, Percy Florence, was born in the city whose name the poet linked with that of the boy. Mary's second tale, *Valperga*, a romance of mediæval Italy, admired by Shelley, was written in 1820. In 1822 Shelley was drowned, and in June, 1823, his widow, in great distress, returned to England. Her father-in-law, Sir Timothy, offered to provide for the boy if she would resign him into his charge, a proposal Mary indignantly declined; but when Shelley's son by Harriet died the baronet recognised the propriety of providing for his heir. Her health was broken by her struggles for her son's sake. In 1840 she revisited Italy with Percy and two college friends: in 1842 they made another tour, also visiting Germany, and when, in April, 1844, Sir Timothy died Mary's long endeavour not to incur debt was rewarded by comparative affluence. She died on February 1st, 1851, in London, esteemed for her intellectual qualities, devoted as a daughter, wife and mother. Many of her writings have fallen into neglect, but *Frankenstein* and her valuable biographical and critical notes on Shelley will preserve her memory.

Shelley, PERCY BYSSHE, poet, essayist, and reformer, was the eldest son of Mr. (afterwards Sir) Timothy Shelley, of Field Place, near Horsham, Sussex, England. Here, on the 4th of August, 1792, he was born. His education began, at the age of six, at a day-school at Warnham, and was continued at Sion House, Brentford, then at Eton, and finally at University College, Oxford, whence, in March, 1811, he was expelled for having circulated a tract on *The Necessity of Atheism*. A few months later he eloped with a schoolfellow of his sister's, Harriet Westbrook, to whom he was married in Edinburgh on August 28th, 1811, with the result that his allowance from his father was stopped, to his great inconvenience. About this time he came under the influence of the writings of William Godwin, and entered into a correspondence with that philosopher. Becoming enthusiastic in the cause of Catholic Emancipation and of Repeal, he wrote an address to the Irish people, and in 1812, accompanied by his wife, went to Dublin, and

there published it. Under the insistent persuasion of Godwin he abandoned this crusade, and on leaving Ireland he and his wife stayed for a while in Wales and Lymmouth, in Devonshire. His behaviour while at Lymmouth in disseminating revolutionary publications was brought to the notice of the Government, and,



PERCY BYSSHE SHELLEY.

after printing at Barnstaple *A Letter to Lord Ellenborough* asserting the liberty of the press, he returned to Wales. In 1813 his first notable poem, *Queen Mab*, was privately printed. Soon after this, his marriage with Harriet Westbrook having been prompted by chivalry rather than any warmer feeling, he fell in love with Mary Wollstonecraft Godwin, daughter of the philosopher, herself a person of remarkable literary gifts, who in 1816 wrote *Frankenstein*, and survived to edit Shelley's *Poems* (1839) and *Letters* (1840). In 1814 he made provision for his wife's maintenance and left her and went with Mary Godwin to the Continent. Lamentable as was this step in a moral sense, the development of Shelley's poetical genius was unquestionably a consequence of it. Early in 1815 his grandfather, Sir Bysshe Shelley, died, and, as the heir to the title and the property, he now received an allowance of £1,000 a year from his father, of which he set apart £200 for his wife. In the following year (1816) he published *Alastor, or the Spirit of Solitude, etc.*; and on his return from a second Continental trip with Mary, during which they were much with Lord Byron, they settled at Great Marlow, where they for the most part lived during the rest of his life in England. In November of 1816 Harriet drowned herself, and a month later, at the instance of Godwin, he legalised his relation with Mary. In 1817 the *Hymn to Intellectual Beauty* appeared, and in 1818 *The Revolt of Islam*. Early in the latter year he and his family removed to Italy. He now set to work upon *Prometheus Unbound*, completed *Rosalind and*

Helen, and wrote his *Julian and Maddalo* and other pieces. His tragedy, *The Cenci*, belongs to 1819, as do *The Masque of Anarchy* and *Peter Bell the Third*. In 1820 appeared *Prometheus Unbound* and *Cenci*, while *The Witch of Atlas* was written. In 1821 came *Epipsychidion* and *Adonais*—a lament for John Keats—and in 1822 *Hellas*. The poet, splendid as had been his achievements, seemed hardly yet to have reached the full measure of his greatness; but in 1822, when he was only in his thirtieth year, his career was brought to an untimely and tragical close. He and his friend Edward Williams, with a sailor-lad, were returning from Leghorn to Lerici in a cutter belonging to himself and Williams, when they were caught in a squall, and all three were drowned. After a time the remains were recovered, and on August 16th Shelley's body was cremated, his ashes being buried in the Protestant cemetery at Rome on the 7th of December. By Harriet he had two children, and by Mary four, the youngest of whom, Percy Florence, became third baronet, and survived till 1889. Among Shelley's more notable contributions to prose are a translation of Plato's *Banquet* and *The Defence of Poetry*. As a reformer he has, in spite of an ardour passionate almost beyond example, exercised little influence, for he was neither practical on the one hand, nor had he philosophic insight on the other. But as a poet, good cause might be shown for placing him next after Shakespeare and Milton. If to most of his creations there is a faintness of outline which makes them hard reading for those who lack the poetic temperament, it is still true that in sheer inspiration, in rapture and exaltation, he ranks with, if not before, the very greatest of English poets.

Shelta, a cant language used by cairds or tinkers, beggars and tramps. It is to be met with in Ireland, Wales and the Highlands of Scotland. To Charles Godfrey Leland (1824-1903), the creator of "Hans Breitmann," belongs the credit of discovering it. He first was attracted to it by hearing it on the lips of an English vagabond on the Bath road in 1876; in the following year he heard it from a vagrant near Aberystwith, and in 1877 he came across it again from an Irish tinker in Philadelphia, who assured him it was the language spoken by the Picts. Leland was proud of his discovery, his great contribution to philology. In a letter he wrote in 1902, quoted in Mrs. Elizabeth Robins Pennell's biography of her uncle, Leland says that Shelta "has yielded a large crop of legends and poems, and is rapidly being recognised as the corner-stone of British Celtic literature." David MacRitchie, following up the discoverer's research, endorsed this and published an article on "Shelta: the Cairds' Language" in Vol. xxiv. of *The Transactions of the Gaelic Society of Inverness*. Dr. Kuno Meyer identified it with Ogham, an obscure speech affected by the ancient Irish, and John Sampson considered it "a back-

slang and rhyming cant based on old or pre-aspirated Irish Gaelic." To more profane, if less scholarly, persons, on the other hand, the jargon has seemed an artificial gibberish, invented for purposes of secrecy and mystification and used as if it were a kind of masonic language.

Shenstone, WILLIAM, poet, was born on his father's estate, the Leasowes at Halesowen, in Worcestershire, England, on November 13th, 1714. His first teacher was Sarah Lloyd, whom he celebrated in *The Schoolmistress*, and from her he passed to Halesowen Grammar School and a private tutor at Solihull, and finally entered Pembroke College, Oxford. After his father's death in 1745 he lived quietly at the Leasowes, devoting himself zealously to landscape-gardening. He died on February 11th, 1763, and was buried in Halesowen Churchyard. His *Elegies*, which are graceful, though tedious, fascinated Robert Burns; but it is mainly by the *Pastoral Ballad* and *The Schoolmistress* (1742) that he has secured a permanent place in literature. Their simplicity of diction and directness of sentiment contrast strongly with the artificiality of contemporary verse. His letters and essays are not without considerable merit.

Shepherd's-purse (*Capella Bursa-pastoris*), a cruciferous weed, native to Europe, which has spread all over the world. It has a rosette of radical leaves and an elongating, corymbose, lax-erect raceme of minute white flowers, which are followed by the heart-shaped, angustisept siliques, the septum of which bears numerous yellow seeds. It is also known as "pickpocket," perhaps from behaving as a noxious weed on good soil, and as "pick-your-mother's-heart-out."

Sheppard, JOHN, usually called JACK SHEPPARD, criminal and prison-breaker, was born at Stepney, London, in 1702. He was brought up in Bishopsgate Workhouse, and afterwards employed by a cane-chair mender, whom he left owing to ill-usage. He was then befriended by a woollen-draper, who taught him to write and sum and apprenticed him to a carpenter. Loose company soon led him from the paths of virtue and he rapidly became known as the most dexterous thief in London. His accomplices were Bess Lyon ("Edgeworth Bess"), Poll Maggott, and "Blueskin" (Joseph Blake). Locks, bolts and bars seemed to have no terrors for him. Once before he could escape he had to remove his irons, cut through a double grating of oak and iron bars, descend 25 feet by a sheet and blanket, and climb a wall 22 feet high (which he achieved with a pal on his back). He was condemned to death at the Old Bailey on August 14th, 1724, but on the 31st (the warrant not having been signed yet) he effected his escape. Captured on September 10th he was again confined in Newgate, the chapel being crammed three days later with persons anxious to get a sight of him. On the

16th he was at liberty again, but nine days afterwards was re-taken in a tavern in Clare Market, where he had been foolish enough to drink himself incapable. This time he was watched day and night in Newgate, and, accepting the inevitable, was hanged at Tyburn on November 16th, his body being buried in the churchyard of St. Martin-in-the-Fields, where the National Gallery now stands.

Sheppey (that is, "the isle of sheep"), formerly consisting of the islands of Sheppey, Elmley and Harty, now practically one, an island off the north coast of Kent, England. It is separated from the mainland by the Swale and the estuary of the Medway, and has an area of some 30,000 acres, including water, with a length of nine and a breadth of five miles. Marshy to the south, it rises to the height of 60 or 80 feet in the north; and the soil, consisting wholly of London Clay, is fertile and yields good corn-crops, besides pasturing large flocks of sheep, for the excellence of which the island still enjoys a reputation. Sheerness lies at the north-west extremity, Queenborough is on the west side, and on the north is Minster-in-Sheppey, the most interesting place in the isle, having in the church of St. Mary and St. Sexburga, though only a fragment of the original conventual church, the oldest abbey church of the Saxon period in England.

Shepton Mallet, a town of Somersetshire, England, 5 miles S.E. of Wells. Before the Conquest Shepton was known as Sepeton and had then belonged to Glastonbury Abbey for four centuries. The manor afterwards passed into the hands of a baron named Mallet, in whose family it remained till the reign of John, when it became forfeit to the Crown in consequence of the baron Mallet of the period siding with his order against the king. It is now held by the Prince of Wales as Duke of Cornwall. In 1685 the Duke of Monmouth and his men visited it twice, an excess of zeal which Bloody Jeffreys acknowledged by sentencing twelve of his followers to be hanged in the market-place. The principal structures are the church of St. Peter and St. Paul in Transitional and Perpendicular styles; the Grammar School, founded in 1627; the Town Buildings, the court-house in the Tudor style, the District Hospital in the Gothic style, and Strode's Almshouses. The manufactures include cloth (the town was once noted for its West of England cloth), knitted stockings, silk, velvet and crape, in addition to brewing, rope-making and brick- and tile-making. The Market Cross, originally built in 1500, is 51 feet high, was restored in 1841, and is one of the finest examples in the shire. Pop. (1901), 5,238.

Sheraton, THOMAS, furniture-designer, was born at Stockton-on-Tees, Durham, England, in 1751. Without any regular education his artistic leanings constrained him to teach himself drawing and geometry. He was taught cabinet-making, but while as a practical work-

man he failed, his skill as a designer of furniture placed him in the front rank of technical artists. In 1790 he came to London and lived in Soho where, in his house, half shop and half dwelling-house, he is described by Adam Black in his *Memoirs*. Black, who as a youth had been employed by Sheraton, calls him a "worn-out encyclopædist . . . a man of genuine piety . . . draws masterly; is author, bookseller and teacher . . . by attempting to do everything he does nothing." He published *The Cabinet-Maker's and Upholsterer's Drawing-Book* in 1791. In 1803 *The Cabinet Dictionary, or Explanation of all Terms used in the Cabinet, Chair and Upholstery Branches* appeared, and in the following year he began the publication of *The Cabinet-Maker and General Artist's Encyclopædia*, a folio to be completed in 125 parts, of which he only lived to issue 30. This is not to be regretted as, yielding to the fashion of the day, the designs were of the worst type and connoisseurs would gladly forget that poverty tempted him to forsake his own high ideals. The equal of Chippendale and Heppelwhite he exceeded them in literary ability. Here is the idea which governed his art: "In furnishing a good house for a person of rank it requires some taste and judgment that each apartment may have such pieces as is most agreeable to the appropriate use of the room." "The drawing-room is to concentrate the elegance of the whole house . . . being appropriated to the formal visits of the highest in rank." Patriotically he urged English craftsmen not to be led away by French fashions but to improve their own. His works were published by subscription and he travelled far to gain subscribers. Although his designs were regarded with "superstitious reverence," he was never prosperous and eked out his income by teaching drawing. He consistently held to his religious principles, was an occasional preacher in Baptist chapels, and wrote also upon religious subjects. He died in Soho, London, on October 22nd, 1806, leaving his family in straitened circumstances, and he whose furniture is often so exquisitely pathetically said, in allusion to his ill-fortune, "I can be well content to sit on a wooden-bottom chair provided I can have but common food and raiment."

Sherborne, a town of Dorsetshire, England, on the Yeo, 6 miles E. of Yeovil. It was the capital of Wessex and King Ina made it a bishopric, which was removed to Old Sarum (Salisbury) in 1078. About this date, or possibly a little earlier, a Benedictine abbey had been founded, the minster of which was sold, after the dissolution of monasteries in Henry VIII.'s reign, to the inhabitants. The noble church still survives, partly Norman but mostly Perpendicular, and contains behind the high altar the graves of Ethelbald and Ethelbert, elder brothers of Alfred the Great. The first castle, originally the episcopal palace, was besieged in the wars of Stephen and Maud and, during the Commonwealth, was held for Charles till it was

captured by Fairfax in 1645, dismantled and gradually became ruinous. The modern castle was in part built by Sir Walter Raleigh, upon whom Elizabeth conferred the manor. On Raleigh's attainer, James I. gave it to his favourite, Carr, from whom it passed to the Digbys, the present lords. It is separated from the ruined castle by a lake and stands in a magnificent park in which are large herds of deer. In its dairy is a Roman tessellated pavement discovered at Lenthay Common. Sherborne Grammar School, occupying part of the site of the abbey, was founded by Edward VI. and holds a prominent rank among the public schools of the country. The Hospital of St. John was founded by Benedictines on the site of an earlier Augustinian house in 1405-6, and re-founded in 1436-7 by Robert Nevill, Bishop of Salisbury. The Macready Literary Institution was established in 1850 and named after the great tragedian, who spent several of his declining years in the town, and the Yeatman Memorial Hospital was built in 1865. The manufactures of woollens, buttons and lace, once flourishing, have given place to silk-throwing and glove-making. The Sherborne Pageant, held at intervals and managed on an elaborate scale, attracts large numbers of spectators. Pop. (1901), 5,753.

Sherbrooke, ROBERT LOWE, VISCOUNT, statesman, was born at Bingham rectory, Nottinghamshire, England, on December 4th, 1811, and received his education at Winchester and University College, Oxford. For some years he was a famous private "coach" in that university, but from 1843 to 1851 he was in Australia, where he at first practised at the bar, and afterwards took a prominent part in political life. In 1852 he entered Parliament as M.P. for Kidderminster, and after holding various minor offices became Paymaster-General under Lord Palmerston. He was Vice-President of the Council on Education from 1859 to 1864, and introduced the Revised Code of 1860, which arranged for payment by results. As leader of the "Adullamites" and still more by his articles in *The Times* he was influential in causing the rejection of the Reform Bill of 1866. After aiding in the disestablishment of the Irish Church, he became Chancellor of the Exchequer under Mr. Gladstone in 1868 (his tenure of office being memorable for the obloquy, somewhat cheap and theatrical, aroused by his proposal in 1871 to tax lucifer matches a halfpenny a box), removing to the Home Office in 1873. In 1880 he was raised to the peerage. His *Poems of a Life* appeared in 1884, and he died at Warrlingham in Surrey on July 27th, 1892.

Sheridan, PHILIP HENRY, the most dashing of the generals who fought in the American Civil War, was born at Somerset, Ohio, on March 6th, 1831. Obtaining a cadetship at West Point, he graduated in 1853 and received his commission. In 1854 he was appointed to the 4th Infantry in Texas and during an attack on

the Indians at the Cascades, Washington Territory (now State), attracted special attention by his bravery under fire. During the unhappy Civil War his talents won rapid recognition. In 1862 he obtained command of the 11th Division of the Army of the Ohio under General Buell, taking part in the fierce battle of Perryville. At Murfreesboro one of the longest battles of the campaign was fought, and his tactical skill and gallantry during several hours in the first day's fighting gained him his commission as major-general. At Chattanooga he again distinguished himself and when U. S. Grant established his headquarters in Virginia, in March, 1864, Sheridan was made commander of the Cavalry Corps of the Army of the Potomac. From May 27th to June 24th he was engaged almost daily and when the Middle Military Division was constituted in August General Grant placed him in command. Opportunity at length came to attack the Southern leader, General Early. Obtaining Grant's laconic permission, "Go in!" Sheridan proceeded vigorously, routing the enemy, capturing 3,000 prisoners and five guns, sending Early, he said, "whirling through Winchester." The following day President Lincoln rewarded him with a brigadier-generalship in the regular Army. Sheridan started in pursuit of Early and when they came to battle the losses on both sides were about equal, but the Northern general succeeded in capturing many guns and small arms. He continued the pursuit but, finding it useless, returned, devastating the country and making it untenable for the enemy. His success secured Maryland and Pennsylvania against the danger of invasion. Then followed the most renowned operations of his adventurous career. Early with reinforcements surprised the Northern army during a fog at Cedar Creek on October 19th and captured 24 guns and 1,400 prisoners. Sheridan, who had been summoned to Washington for consultation, was then at Winchester. Hearing the din of battle he dashed off with an escort of only twenty men, rallied the fugitives he met during his ride of twelve miles (celebrated in the stirring poem "Sheridan's Ride") and when he reached his troops was greeted with wild enthusiasm. After making hasty preparations he ordered an advance and swept the enemy off the field. Not only were their guns recovered, but 24 Confederate guns with wagons and stores were taken. Congress passed a vote of thanks to him and to his troops for their brilliant series of victories and he was again promoted for personal gallantry. In February, 1865, he once more defeated Early at Waynesboro, and, in the final campaign on April 1st, entrapped and routed Pickett and Johnson's forces at Five Forks, taking thousands of prisoners. The engagement proved decisive. General Robert Lee was soon in flight with Sheridan in pursuit. On April 9th the power of the Confederates was broken by their surrender at Appomattox Court House and although desultory engagements continued

until later the war was practically ended. Sheridan subsequently conducted an expedition into North Carolina and held commands in New Orleans and elsewhere. During the Franco-German War he visited Europe, being present as a spectator with the German forces. When General Sherman retired in March, 1864, Sheridan was appointed Commander-in-Chief of the Army of the United States. He died on August 5th, 1888, at Nonquit, Massachusetts. Highly esteemed both by Bismarck and Moltke, his energy and self-reliance in time of danger were conspicuous, and he is regarded as the most brilliant cavalry officer the United States has produced.

Sheridan, RICHARD BRINSLEY BUTLER, dramatist, orator, and statesman, was born in



RICHARD BRINSLEY SHERIDAN.

Dublin on October 30th, 1751, son of Thomas Sheridan (1719-88), actor and lexicographer, and grandson of Dr. Thomas Sheridan (1687-1738), the friend of Dean Swift. He was educated at a school in Dublin and afterwards at Harrow. He entered the Middle Temple on April 6th, 1773, and a week later married Elizabeth Ann Linley, the beautiful singer, whom he had really married in the previous year at a village near Calais, while escorting her to France to avoid the odious persecution of a *roué* named Mathews. His first notable dramatic achievement was *The Rivals*, which appeared with great *éclat* in 1775, and was followed by the farce *St. Patrick's Day*, and this by the opera *The Duenna*, a brilliant success. In 1776 he acquired a share in Drury Lane Theatre. Here, in 1777, he produced the *Trip to Scarborough*, adapted from Sir John Vanbrugh's *Relapse*, and his finest comedy, *The School for Scandal*. Here, too, was recited, in 1779, his *Monody to the Memory of Garrick*. In the same year he produced *Pizarro* and his last original play, *The Critic*. By the influence of Fox he was elected for Stafford in 1780, and two years later entered the Rockingham Ministry as Under-

Secretary of State for Foreign Affairs, retiring with his friend Fox, and in 1783 becoming Secretary to the Treasury in the short-lived Coalition Ministry. Many years later—in 1806—he became Treasurer of the Navy; but he had little capacity for office, and his parliamentary gifts found more appropriate exercise during the long spell of opposition between the Coalition Ministry and the Fox and Grenville Administration. His "Begum" speech, delivered in 1787 in the impeachment of Warren Hastings, was declared by so unsympathetic an auditor as Pitt to have "surpassed all the eloquence of ancient and modern times." In the rupture between Fox and Burke, Sheridan remained faithful to the former. He opposed the union between Great Britain and Ireland and succeeded Fox in the representation of Westminster (1806), a seat which he held for only a few months, but was returned for Ilchester in 1807, which he retained till 1812. A strong advocate of the Prince of Wales's cause in the Regency debates in 1789, he became the Prince's boon companion, and his indefensible action in connection with Prince George in 1810 deprived him of the confidence of the other Whig leaders, and virtually marks the close of his political career. Always reckless and extravagant, he was often in pecuniary difficulties; and at last, by the burning down of Drury Lane Theatre in 1809, followed by expensive elections, he was reduced to poverty, the last four years of his life, when, having lost his seat, he was no longer safe from the bailiffs, being spent in attempts to evade his creditors. He died on the 7th of July, 1816, and was buried with great pomp in Westminster Abbey. A few years after the death of his first wife, to whom he was devoted, he married Esther Jane Ogle, daughter of the Dean of Winchester.

Sheriff is the chief officer of the Crown in every county in England. He does all the sovereign's business in the county, the Crown by letters patent committing the custody of the county to him. The judges, together with the other great officers and privy councillors, meet in the Exchequer on the morrow (November 12th) of St. Martin yearly, and then and there the judges propose three persons from each county to be reported, if approved of, to the King, who afterwards appoints one of them (usually the first on the list) to be sheriff, and such appointment generally takes place about the end of the following Hilary Term. The final ceremony of selection is known as the "pricking for sheriffs," because the sovereign "pricks off," or pierces the lists with a punch opposite the names of the persons appointed. If a sheriff die during his term of office, the appointment of another is the mere act of the Crown. The duties of a sheriff in England are chiefly ministerial, i.e., the execution of writs and orders of the courts, though he has a judicial office in the assessment of damages with the assistance of a jury, where judgment has

gone by default against a defendant in the superior courts. But in Scotland the sheriff is the chief judge of the county, his civil jurisdiction extending to all personal actions on contract, bond, or obligation to the greatest extent, also by a statute of the reign of Victoria to actions relating to a heritable right where the value of the subject matter does not exceed £50 per annum or £1,000 value and to all possessory actions as removings, spuilzies, etc., to all briefs issuing from Chancery in Scotland, as of inquest, terce division, tutory, etc., and generally to all civil matters not specially committed to other courts. He has also a summary jurisdiction in regard to small debts as well as a criminal jurisdiction.

Sheriffmuir, a moorland tract on the north-western flanks of the Ochils, Perthshire, Scotland, 2½ miles E. by N. of Dunblane. It is noted as the scene of the chief conflict of the first Jacobite rising. On the 13th of November, 1715, the Jacobites, 8,400 strong, under the Earl of Mar, met the Royalists, 3,500 strong, under the Duke of Argyll, and after a fierce combat in which both sides won successes in detail, victory declared for neither party. But though it was a drawn battle, Argyll derived all the material advantages, for Mar retreated after nightfall. The Old Pretender's cause collapsed shortly afterwards. The Rev. John Barclay (1734-98) wrote a sarcastic ballad on the battle and its futilities, which Robert Burns revised.

Sherlock, THOMAS, Bishop of London, was born in London in 1678, and educated at Eton and St. Catherine's Hall, Cambridge. He took holy orders and in 1704 was appointed Master of the Temple, in succession to his father. In 1711 he was made chaplain to Queen Anne and other Church appointments followed rapidly. He became Prebendary of St. Paul's Cathedral in 1713, Master of St. Catherine's Hall and Vice-Chancellor of Cambridge University in 1714, Dean of Chichester in 1715, Canon of Norwich in 1719, Bishop of Bangor in 1728, and Bishop of London in 1748, after he had refused the see of York (1743) and Canterbury (1747). He died at Fulham, London, on July 18th, 1761. He took the leading part against Bishop Hoadley in the Bangorian controversy (1717) and his best-known book was *The Trial of the Witnesses of the Resurrection of Jesus* (1729).

Sherlock, WILLIAM, Dean of St. Paul's and father of the preceding, was born at Southwark, London, about 1641, and educated at Eton and Peterhouse, Cambridge. He took holy orders and in 1669 was preferred to the rectory of St. George's, Botolph Lane, London, and in 1685 was appointed Master of the Temple. A believer in the divine right of kings and also a strong opponent of Popery he managed to survive the reign of James II. without loss of place. At the Revolution he acted with the Nonjurors, but took the oath in 1690. In the preceding year he had published his most popu-

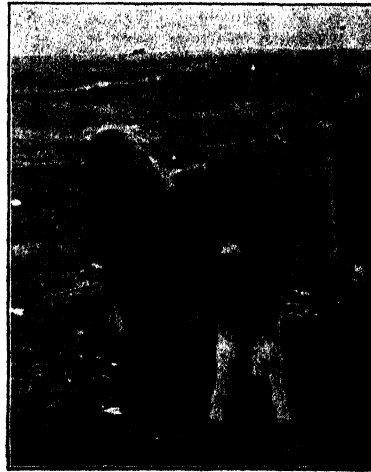
lar book, *Practical Discourse concerning Death*. Having made his peace with Crown and Church, he was preferred to the Deanery of St. Paul's in 1691. He died at Hampstead, London, on June 19th, 1707. His *Vindication of the Doctrine of the Trinity* (1690) plunged him into more controversy than he cared for, much as he liked disputation. His enemies accused him of maintaining tritheism and his doctrine was condemned at Oxford as "false, impious and heretical" (1695). In his *Present State of the Socinian Controversy* (1698) he seceded from the positions which had been assailed and was open to Robert South's taunt, "There is hardly any one subject that he has wrote upon (that of Popery only excepted) but he has wrote for and against it too."

Sherman, WILLIAM TECUMSEH, general, was born in Lancaster, Ohio, United States, on February 8th, 1820. He graduated at West Point, was engaged in the Indian warfare of the early 'forties and took part in the Mexican War of 1846. He returned to civil life in 1853, but, on the outbreak of the Secession War, entered the Northern Army, and distinguished himself under Grant at Shiloh (April, 1862) and Chattanooga (November, 1863). Appointed to the command of the south-western division in March, 1864, he proceeded to operate against General J. E. Johnston, the chief point of his attack being Atlanta in Georgia. As long as Johnston remained in command he was baffled by his skill in manœuvring, but when he was superseded by Hood a series of battles ensued, in which the Confederates were invariably beaten, and in September Atlanta surrendered. On November 16th he set out on his famous march to the sea, which occupied 28 days and was followed by the fall of Savannah. In the early months of 1865 Sherman gained numerous successes in the Carolinas, and on April 26th the Confederate army under Johnston surrendered at Durham Station. When Grant became President Sherman was appointed General and Commander-in-Chief (1869), but in 1874 he retired at his own request. He died at New York on February 14th, 1891.

Sherry, the English name of a Spanish wine which is made from grapes grown in the neighbourhood of Xeres or Jerez de la Frontera, Andalusia. The qualities of the wine, which is made both from white and red grapes, are owing to the nature of the soil, which is composed of carbonate of lime, magnesia, clay, and silice. The grapes, after drying, are placed in vats and covered with a layer of gypsum, and then trodden. The wine is allowed to ferment for a couple of months, is then racked off, and that which is intended for exportation is fortified with brandy. Sherry is at its best after fifteen or twenty years in bottle. The wine owes its nutty flavour to an admixture of bitter almonds. The best sherry is Amontillado, the supply being limited by the small district which possesses the suitable soil. Cadiz is the principal seat of exportation.

Sherwood Forest, a sylvan hilly tract in Central England, which may be roughly considered as extending from Nottingham to Worksop, a distance of 25 miles, north and south, by about 8 miles in width, but in former times, in the pre-enclosure period, embraced a much wider area. Important towns like Mansfield and Chesterfield have grown up within the region and the private parks of the Dukes of Portland (Welbeck Abbey), Newcastle (Clumber), and Devonshire (Hardwick) are also to be found within the territory. Traditionally the Forest is associated with the Dragon of Wantley and, much more certainly, with the exploits of Robin Hood, "the English ballad-singer's joy."

Shetland, or ZETLAND, ISLANDS, the most northerly county in Scotland, 50 miles N.E. of the Orkneys, excluding Fair Isle, which belongs to Shetland and lies between the two groups. They extend north and south for



SHETLAND PONIES.

70 miles and have a breadth of 36 miles, and occupy an area of 551 square miles. The group numbers rather more than 100 islands (the variation being due to where one ceases to include the uninhabited rocks), of which 29 are inhabited. The largest is Mainland (378 square miles) and next to it come Yell (83 square miles), Unst (47 square miles), Fetlar, Bressay, Whaleay and Foula. The highest points are Ronas (1,475 feet) in the north-west of Mainland, and the Sneug (1,372 feet) in Foula. There are several brooks and fresh-water lakes. The coast is so cut into and indented that no point is farther than three miles from the sea. The climate is mild, but damp (rainfall 49 inches a year) and liable to fog. The coast scenery is extremely fine and the rock colouring in certain atmospheric conditions beautiful. There are no native trees,

and the soil is largely moss and peat. The principal crops are barley, oats, turnips and potatoes. Sheep, cattle and pigs are raised, and especially the ragged Shetland ponies or shelties, from 9 to 10 hands high. The knitting of fine shawls and other articles from the wool of the native sheep is the characteristic industry, but the most important is the deep-sea fishery. The men employed are crofters and fishermen. Lerwick (4,061) on Bressay Sound, on the east coast of Mainland, the capital, has a remarkably fine town hall. Shetland was subject to Norway until 1468, when along with the Orkneys it was pledged with the King of Scotland for the dowry of the Danish princess Margaret. In 1766 the group was sold by the Earl of Morton to Sir Lawrence Dundas, ancestor of the present Earl of Zetland, who derives his title from the group. The Norse tongue lingered in Foula till 1774. Of the Picts, the earliest inhabitants, numerous examples of their weems, or underground dwellings, still exist as well as specimens of the broch, or round tower, notably that on Mousa, alleged to be the most perfect of its kind in Europe. Pop. (1901), 28,185.

Shiahism. The world of Islam is divided into two churches, the Shiah and the Sunni. The Shiah Church traces its foundation to the Caliph Ali, first cousin of Mohammed and husband of his daughter Fatima, and believes him to have been the first legitimate imam or successor of the Prophet. It thus rejects the first three Caliphs of the Sunni Church as usurpers. Shiahism is the State religion of Persia and it is estimated that twenty millions of Indian Mussulmans are Shiahs. The Sunni Church was founded by Mansur, the second Caliph of the house of Abbas. "The wide extent of the Abbasside Caliphate," says Ameer Ali in *Islam* (London: Constable), "helped in the diffusion of its power and influence." This writer reckons that fifty millions of Indian Mohammedans belong to the Sunni Church, as also do the Mussulmans of China, Tartary, Afghanistan, Asiatic and European Turkey, Arabia, Egypt, Northern and Central Africa, Bosnia, Herzegovina, Russia, Ceylon, the Straits of Malacca, and the Malay Peninsula, almost all of whom acknowledge also the spiritual headship of the Sultan of Turkey. "The question of the title to the spiritual and temporal headship of Islam," explains Ameer Ali, "forms the chief point of difference between the two churches. The Sunnis are the advocates of the principle of election; the Shiahs of apostolical descent by appointment and succession; and this difference, which is essentially of a dynastic character, gave birth to constant quarrels." Ameer Ali, however, believes that "extraneous circumstances" will ultimately compel both Shiahs and Sunnis "to realise the necessity of greater harmony and goodwill."

Shibboleth has come to mean a party cry or watchword. It owes its origin as such to a

passage in the Bible (Judges xii. 6) describing the war between Jephthah and the Ephraimites. When the latter tried to escape over the Jordan Jephthah's men intercepted them at the ford, and gave all passers the word "Shibboleth" to pronounce as a test. The Ephraimite would say "Sibboleth," and thus betray his nationality.

Shield, an article of personal defence or armour which was used from very ancient times. The *clypeus* of classic times was made of metal, and was round in shape; the *scutum* was oblong, and generally of wood covered with skin, and was often convex; the *parma* was of skin; and the *pelta* crescent-shaped. The Norman shield was triangular, becoming at a later period heart-shaped. The Bayeux Tapestry and brasses of different dates show us the modifications of the mediæval shield. The introduction of fire-arms did away with the necessity for its use in warfare, and new methods of fencing rendered it obsolete in personal combat. The Highlander retained his targe till a late period. The Zulu warrior used a shield of hide which was impervious to the assegai.

Shield, WILLIAM, musical composer, born at Swalwell, in Durham, England, on March 18, 1748. His father taught him the rudiments of music and he continued his studies in Newcastle, while serving his time to a boat-builder in South Shields. On the advice of Giardini, who knew of his skill as a violinist, he took to music professionally, and after engagements in the theatre orchestras of Scarborough, Durham and Newcastle, he removed to London, where he became principal viola at the Italian opera in 1772, a post he held for eighteen years. The success of his comic opera the *Fitch of Bacon* (1778) led to his being appointed composer to Covent Garden. In 1793 he formed, along with others, the famous Glee Club, and was an original member of the Philharmonic Society. He died in London on January 25th, 1829, and was buried in Westminster Abbey. He composed the music for more than thirty plays and wrote many songs that are still admired, such as "The Thorn," "The Wolf," "The *Arethusa*," and "Oxfordshire Nancy Bewitched."

Shields, NORTH, a seaport of Northumberland, England, on the north bank of the Tyne at its mouth, 8 miles E. of Newcastle. Its progress was studiously repressed by Newcastle for several centuries, but in the 19th century it took courage to assert itself and soon became a prosperous community, forming part of the parliamentary borough of Tynemouth. The principal buildings are the town hall, market, free library, museum, Tyne Sailors' Home, and the Master Mariners' Hospital. The chief docks are the Northumberland (55 acres) and the Albert Edward (24 acres). The industries include shipbuilding and the making of anchors, chain cables, ropes, marine engines,

and glass, in addition to fisheries. Enormous quantities of coal are exported annually. Myles Birket Foster (1825-99), the water-colour painter and black-and-white artist, was a native. Pop. (1901), 5,737.

Shields, SOUTH, a seaport of Durham, England, on the south bank of the Tyne at its mouth, 8 miles E. of Newcastle. It and North Shields, with which there is frequent communication by steam ferry, are the "twin ports" of the Tyne though in different counties. It is supposed to have been a Roman station and derived its name from the fishermen's huts, or shields. The principal buildings are the church of St. Hilda, the town hall, exchange, the public library and museum, marine school, Master Mariners' Asylum and Ingham Infirmary. It was once the seat of a great salt trade, but the chief manufactures now include chemicals, glass, pottery, boilers, anchors, chain cables, ropes and sailcloth, besides shipbuilding. The capacious docks and harbour are protected from the south-east gales by a huge breakwater, and the fine beach, promenade and marine park have given the town considerable vogue as a midsummer resort. There is a monument to William Wouldham and Henry Greathed, the inventors of the lifeboat, and near it stands the Tyne lifeboat, at rest after its long and honourable career, during which it saved more than a thousand lives. Pop. (1901), 96,267.

Shifnal, a town of Shropshire, England, 17 miles E. by S. of Shrewsbury. It was formerly called Idesall, which was yet its name when, in 1591, Elizabeth sanctioned a collection throughout Shropshire, Staffordshire, Flintshire and Montgomeryshire to recoup the ravages of a conflagration by which it had been almost entirely destroyed. The church of St. Andrew contains examples of the Early English (the south porch), Transition, Norman, Decorated and Perpendicular styles. Among its memorials is one to Mary, wife of Joseph Yates, who died in 1776 at the age of 127, and who is said to have married her third husband when she was 92. The public buildings include the mechanics' institute, library and market hall. It has iron-foundries and coal- and iron-mines. Pop. (1901), 3,321.

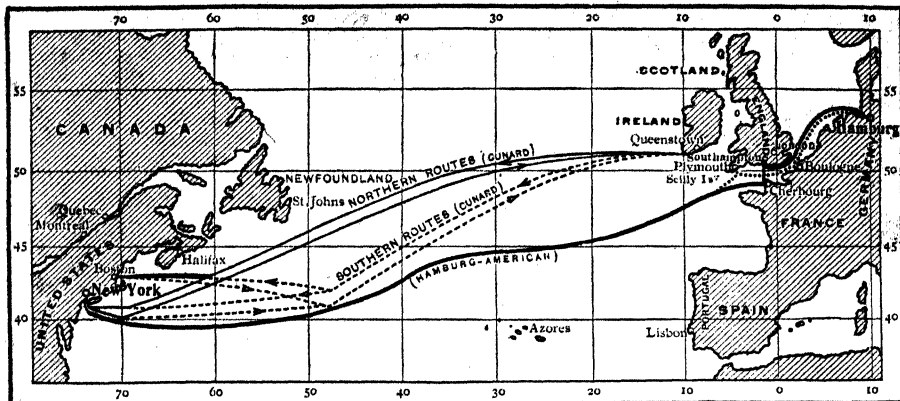
Shikarpur, a district in Sind, Bombay, India. It occupies an area of 9,300 square miles. It is a vast alluvial plain, part of which contains patches of salt land, while other parts are tracts of clay and sandhills. The chief crops are wheat, millet, rice, pulse and oil-seeds, but tobacco, indigo, sugar-cane and other plants are cultivated. Agriculture depends almost wholly on the Indus canal system and the river in flood occasionally has wrought great havoc. The former capital, Shikarpur (49,491), commands the trade of the Bolan Pass. The administrative headquarters are situated at Sukkur. Pop. (1901), 1,018,237.

Shillelagh (Irish, "sons of Fluch"), a bludgeon carried by Irishmen for ornament or use, as occasion offers. It derives its name from the forest of oaks in Shillelagh in county Wicklow, Ireland, which supplied the wood of which the cudgels were usually made. The trees also furnished the timber for the noble roof of Westminster Hall, which is said to have been sent over by the King of Leinster to William Rufus. The "Tipperary rifle" is a longer staff, quite as stout, of blackthorn, from which the boughs have been cut off near enough to the stem to leave it adorned with bosses which increase the ugliness of the wounds that the weapon can inflict.

Shilling, as an English silver coin, dates from Henry VII. The present shilling is the twentieth of a pound sterling, and is equivalent to 12 pence, and approximately to 25 cents American, 1·25 franc French, and 1·11 mark German. It contains 87·272 grains silver, of a fineness of ·925, the remainder consisting of copper alloy. Its bullion value being greatly below its face value, it is really a token of exchange, on which account the number of shillings, or other silver coins, that constitute legal tender is strictly defined. In the United Kingdom the legal tender of silver has been fixed at not more than two pounds. In the case of the present coin, therefore, forty shillings is the legal tender.—To "take the King's shilling" is a colloquialism implying that a man has enlisted by accepting a shilling from the recruiting-sergeant.

Shiloh, a town of Ephraim, where was the sanctuary of the Ark under the priesthood of the house of Eli. Shiloh was destroyed by the Philistines after the battle of Ebenezer. It has been identified with the present Seilun, 2 miles E.S.E. of Lubban (Lebonah) on the road from Bethel to Shechem, and 20 miles N. of Jerusalem. Behind the village rises a flat double-topped eminence, suggestive of a stronghold as well as a sanctuary. Shiloh in Benjamin was the home of Eli and Samuel. The phrase "until Shiloh come" in the Blessing of Jacob (Genesis xlix. 10) is one of the obscure texts of the Bible. It is currently invested with a Messianic meaning, but Professor T. K. Cheyne holds that if "Shiloh" be regarded as a scribe's error for "Laiashah," as is probable, the passage will then be transformed into a psalm of the praise of the might of Judah.

Shimonoseki, formerly called AKAMAGASEKI, a fortified seaport at the south-western extremity of the island of Hondo, Japan, 520 miles W.S.W. of Tokyo. It was bombarded in 1864 by the combined fleets of Great Britain, the United States, France and Holland, and in 1895 the treaty between Japan and China was concluded here. The Strait of Shimonoseki, at one part only a quarter of a mile wide, divides Kiushiu from Hondo and connects the



SHIPBUILDING: ATLANTIC ROUTE MAP.

Inland Sea with the Sea of Japan. Pop. (1903), 46,285.

Shingle, a kind of detritus worn by water, a little coarser than gravel. The word is commonly employed to describe the character of the beach at a watering-place.—A SHINGLE, or shindle, is a planed wooden board, ordinarily 18 inches long by 6 inches wide, used for covering the sides and roof of a house in the same way as a tile or slate is used. One end is thicker than the other and the shingle should be stout enough to stand weather and wear and tear. In the United States, where shingles are largely used, it is customary to lay them with two-thirds of their length covered and one-third of lap (or exposure). They are generally made in that country from the wood of a variety of oak (*Quercus imbricaria*).

Shingles (Lat. *Cingulum*, a girdle). [HERPES.]

Shintoism. [JAPAN.]

Shinwari, a powerful Afghan nation, whose territory comprises part of the Khaibar Mountains and some of the eastern valleys of the Sufed Koh range. It consists of four main divisions, Sangu, Ali Sher, Sipai and Mandu, with about 30 minor groups. The Shinwari and neighbouring Orakzaes and Afridis are collectively known as Khaibaris.

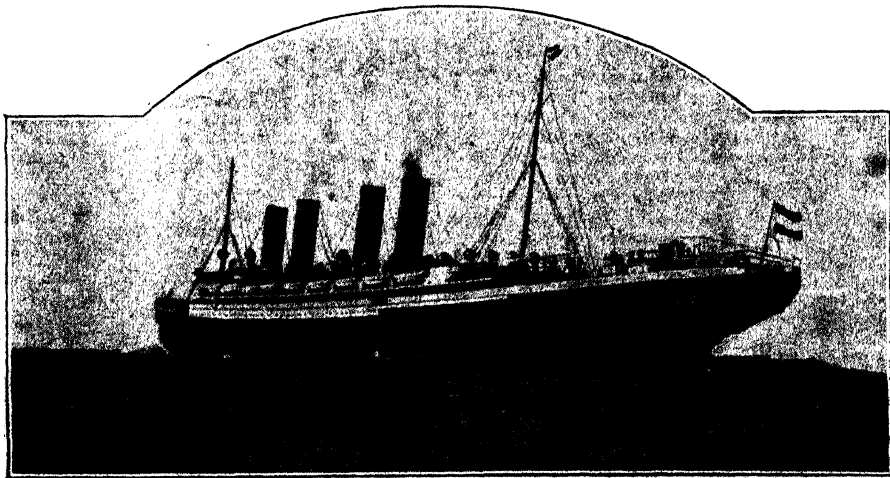
Ship-broker, one who transacts the business for a ship when in port—as, for example, the procuring of a cargo—or who buys and sells ships.

Shipbuilding is an art whose origin is lost in antiquity. Perhaps the Chinese were the earliest practisers of it, and the ships of the Greeks, Romans, and Phœnicians must have been of a high order of merit. The barbarian invasions seem to have destroyed the art generally, though round the Mediterranean it still flourished, and the Norse and Saxon galleys had their good points. A Norse galley, discovered in a cairn, was fitted for sails and

oars, and was 75 feet long by 16 feet wide. Though an English fleet existed, and fought in early times, England made but slow progress at a later period. The order of excellence seems to have been Genoese, Spanish, French, English, and even in the 17th and 18th centuries England copied French models. One vessel was launched in 1511 which created a vast sensation. This was the *Great Michael*, which was built at Newhaven, on the Forth, the small but picturesque suburb of Edinburgh, the last place where one would look for such an exploit nowadays. She was 240 feet long by 36 feet wide, inside measurement, her sides were 10 feet thick, she consumed all the available oak from Fife (excepting that from the forest of Falkland) and Norway and cost £30,000, an enormous sum in those days. She carried many heavy guns, 300 mariners, 120 cannoners, and 1,000 soldiers. Her commander was the famous sailor, Sir Andrew Wood, whom in 1510 James IV. had created Admiral of the Seas. She was sold to Louis XII. in 1514 and is said to have been suffered to rot in the harbour of Brest. The *Grâce de Dieu*, built by Henry VIII. in 1514—probably as a counterblast to the *Great Michael*,—was of 1,000 tons burden, contained 700 men, and carried 120 guns; but in the 16th century England, in spite of defective types, could hold her own with Spain and Holland. In 1637 appeared the *Sovereign of the Seas*, the first English three-decker; but in the beginning of the 19th century the United Kingdom, and still more America, took the lead. The Baltimore clippers were the first to demonstrate the advantage of sharp over rounded bows, and the square-rigged clippers of the Chinese tea-trade were a further revelation in this direction. The discovery of steam caused a great revolution, but the United Kingdom still clung to faulty theories, which America discarded in favour of practical advantage. The *Sirius* (1838) was the first steamer that went to

America, and the first iron ship was the *Great Britain*, constructed in 1843. The last three-decker built for the navy was the *Duke of Wellington*. The *Great Eastern* gave an impulse to the building of large vessels. As types of two different styles, one may look at the graceful lines of the *City of Rome* and the straight, perpendicular bows of the Cunarders. The invention of the screw was one of the greatest improvements in the construction of ships, since it enabled large vessels to enter harbours which would have been impossible for broad paddle steamers. Another innovation appeared with the 20th century, when steamers were propelled by an adaptation of turbines acting directly on the screw shaft. Steamers thus driven were tested in 1901 and 1902 on the Clyde with entirely satisfactory results, and certain of the cross-Channel steamers were afterwards equipped with turbines. It was found that they made the trip in somewhat quicker time than the screw steamers and, what was of infinitely greater importance on such a run, had a distinct tendency to reduce the liability to *mal de mer*. The keel, which was so important in a wooden ship, of which it was the backbone, is not of so great importance in an iron ship, which is bolted together, and whose parts mutually support each other. The keel is formed of plates riveted together, and from these arise the ribs, which are held rigid by iron beams. The skin of plates is riveted on to these ribs by thousands of rivets, and sometimes there is an inner skin, which adds to the stability and safety of the vessel. The same object is advanced by the watertight compartments, longitudinal and transverse, which are now almost a constant feature of newly-built ships. When a ship is ready for launching, parallel timbers, called "ways," are arranged under the keel on

each side, and upon these are loose timbers, well-greased, and reaching almost to the vessel, wedges of soft wood being driven in between these timbers and the ship's side; the whole apparatus is called a cradle. At the moment of the launch the wedges are knocked away, and all fastenings, except a cable and anchor which drags along the ground and checks the impetus of her enormous weight, are loosed, and she glides with the greased timbers down the ways into the water. There is not so much uniformity of type and design among modern ships of war as in merchant and passenger steamers, since authorities are at perpetual variance as to the merits of different designs. When the United Kingdom adopted Free Trade she rapidly became the world's carrier, which led to an immense development of the mercantile marine in many countries and on all oceans and seas, of which, however, there were signs even before the epoch-making era of 1846. The great competition was to secure the traffic with the United States, for which purpose the Cunard Company was formed. It was named after Samuel Cunard, of Halifax, Nova Scotia, a wealthy and enterprising Quaker, who soon induced George Burns of Glasgow and David MacIver of Liverpool to join hands with him. The company was formed with a capital of £270,000 and obtained for seven years the contract for a fortnightly mail service between Liverpool, Halifax and Boston. By 1840 the first four boats of their fleet were on the sea. It became apparent that since Boston harbour could not be guaranteed ice-free in winter, a port farther south would have to be the American objective. So the company selected New York and dropped the call at Halifax. In 1850 the Collins Line, heavily subsidised by the United States Government, challenged the



SHIPBUILDING: THE "KAISER WILHELM."

[Photo: West & Sons, Southampton.]

Cunard supremacy, but, though it performed remarkable passages, lavish expenditure and several terrible disasters ultimately put an end to its rivalry. In the same year the Inman Company was started from the English side, running from Liverpool to Philadelphia at first and afterwards to New York. The Guion Company, founded in 1866, did not seem to have a proper chance until it went to the Clyde for its boats, and it is interesting to note that it was to the *Alaska* (6,400 tons) of this corporation that the epithet of "greyhound of the Atlantic" was first expressly applied. In 1870 another concern destined to achieve fame on the Atlantic made its *début* as the White Star. It was established by Ismay Imrie and Company, of Liverpool, and went to Harland and Wolff of Belfast for its steamers. The National Line's *America*, in June, 1884, made the eastward run in 6 days, 14 hours, 8 minutes, an achievement that was immediately capped by the *Oregon* (built for the Guion but purchased by the Cunarders, under whose flag the double-first was won) making both trips—that is, out and home—within the month of August. When records came to be taken note of the old Inman Line under its new title of the Inman and International (the "I. and I.") did some magnificent work with their second *City of Paris* and their *City of New York*. Then came the era of German competition, for in 1897 the *Kaiser Wilhelm der Grosse*, built by the Vulcan Company at Bredow, near Stettin, for the North-German Lloyd, made some wonderful trips, which were eclipsed in 1900 by the *Deutschland*, from the same yards, of the Hamburg-American Line. These vessels were followed by the *Kronprinz Wilhelm* and *Kaiser Wilhelm II.* In being able to tap Central Europe at Bremen and Hamburg, France at Cherbourg, and England at Southampton, the Germans have a manifest advantage in respect of passengers and goods. Their area is almost a whole continent, whilst British shipping companies have only their own islands to draw upon. The Cunarders did not seem disposed to run risks for the sake of saving a few hours over a course of 3,000 miles, but when it was evident that safety and express speed were not incompatible, their magnificent *Lusitania* made her maiden voyage from Queenstown to New York in 5 days and 54 minutes (Sept. 8-13th, 1907), the quickest run westwards, though not a record for the journey. It was also significant that in 1907 the White Star transferred several of their express steamers from Liverpool to Southampton. In France the great shipping companies are the Compagnie Transatlantique and Messageries Maritimes, the latter running to the Far East. The Cape route formerly was mainly worked by the Union Company of Southampton and the Castle Line of London, owned by Sir Donald Currie, a competing service that has been amalgamated as the Union-Castle. The Royal Mail caters for the West Indies and South America and the Peninsular and Oriental (the "P. & O.") and

Orient Companies run to Australia and the Far East. In addition to these there are many companies and private shippers whose steamers, fast and splendidly equipped, navigate every ocean with a certainty and celerity that would not discredit any of the gigantic corporations which have been specifically mentioned.

Shipka, a pass across the Balkan mountains, Bulgaria, between Gabrova, 14 miles to the north, and Kazanlik, 9 miles to the south of the range. It has an altitude of 4,376 feet above the sea. In the Russo-Turkish war of 1877-8 the Russians held the pass in July, 1877, against repeated attacks of the Turks, and on January 9th, 1878, a large Turkish force was obliged to surrender here. The village of Shipka is 3 miles south of the pass.

Shipley, a town of the West Riding of Yorkshire, England, about 3 miles N.W. of Bradford, of which it is virtually a suburb. Much of the surrounding country is picturesque, since it opens out into the well-wooded and beautiful district of Lower Airedale. The manufacture of worsted is the predominant industry and there are several quarries in the parish. Pop. (1901), 25,573.

Ship-Money, the name of a tax imposed at different periods in England for the naval defence of the country, and laid generally upon seaports and maritime counties, certain privileges being granted in return. We meet with it as early as 1007, to furnish defence against Norse rovers, and in the time of Elizabeth it was resorted to as a means of providing a fleet against the Spanish Armada; but the question of ship-money came to the front in politics in the reign of Charles I. He in 1634, by exercise of his prerogative, imposed this tax upon London and other seaport towns, giving the authorities leave to raise it by assessment. He met the objections to paying it with obstinacy, and extended it to the whole kingdom. In 1637 John Hampden, by refusing to pay, brought the question to a legal trial in the Court of Exchequer. A majority of eight out of the twelve judges decided in favour of the Crown, and Hampden was condemned; but one of the first measures of the Long Parliament, in 1640, was to declare the exercise of prerogative illegal.

Shipton, MOTHER, the prophetess, has been identified, on indifferant evidence, with URSULA SONTIEL, who was born at Knareborough, in Yorkshire, in 1488, married Tony Shipton, a carpenter of Skipton, and died at Clifton, in Yorkshire, in 1561. In reality, however, most of the tales concerning her are derived from the *Life and Death of Mother Shipton* (1677), by Richard Head (1637-1686), a dissolute blackguard, whose authority can carry little weight. It was no doubt owing to his representations that the stereotyped portrait of Mother Shipton as a hideous old woman obtained its vogue. The spawwife was probably as mythical as Mrs. Harris. The

oldest collection of her prophecies now in existence was published in 1641.



MOTHER SHIPTON.

Ship-worm. [TEREDO.]

Shiraz, the capital of the province of Fars (Faristan), Persia, 120 miles E.N.E. of Bushire on the Persian Gulf. It lies at the border of a plateau 5,000 feet above the sea, and has suffered severely at times from earthquake. The city itself is cramped and dirty, but has a good bazaar, some handsome mosques, and a few fine private houses. In the neighbourhood are the famous rose-gardens, fruit orchards, and vineyards celebrated by the poets Hafiz and Sa'di, whose tombs lie in their midst. It was probably founded in the 8th century, and has once or twice been the capital of the empire. It has manufactures of wine, rose-water, inlaid work in wood and metal, silver-ware, glass, and textiles. Pop. (estimated), 50,000.

Shiré, a river of South Africa, flowing out of the southern end of Lake Nyasa, in a direction mainly southerly, and falling into the Zambesi at Shamo, after a run of about 370 miles. But for the falls and rapids between Matope and Katunga, of which Murchison Falls are the most conspicuous, a distance of some 80 miles, it would be navigable throughout its course. It was discovered by David Livingstone in 1859.

Shirley, JAMES, dramatist, was born in London on September 18th, 1596, and educated at Merchant Taylors' School, and St. John's College, Oxford, whence he removed to Catherine Hall, Cambridge. He took holy orders but resigned his living in consequence of his conversion to the Roman Catholic religion, and became a master at St. Albans grammar school. However, finding the occupation distasteful, he in 1625 established himself in London as a playwright. Among his most notable pieces were the comedies of *Hyde Park* (1632), *The Ball* (1632), and *The Gamester* (1633), and the tra-

gedies of *The Traitor* (1631), *The Royal Master* (1638), and, probably his masterpiece, *The Cardinal* (1641). After the closing of the theatres by the Puritans (1642) he again earned his living by teaching. His plays reappeared on the stage after the Restoration, but he did not produce any new ones. Shirley and his wife died on the same day in November, 1666, in distress and want, having lost their all in the Great Fire, and were buried in St. Giles's Churchyard, London. Charles Lamb calls Shirley "the last of a great race"—i.e., the Elizabethan dramatists. His works display the same characteristics as those of his predecessors, but much that in the latter is the product of original genius must, in his case, be attributed to mere stagecraft.

Shishak, the name of several Egyptian kings of the 22nd dynasty. Shishak I. sheltered Jeroboam after his escape from Palestine during the reign of Solomon, and afterwards made war on Rehoboam and captured Jerusalem. Events connected with this expedition are depicted on the monuments of Karnak.

Shoa, the southernmost of the three kingdoms or divisions of Abyssinia, lying between the Bahr-el-Azrek, or Blue Nile, and the Hawash. Its limits have not been closely determined, but its area is approximately estimated at 20,000 square miles. Its surface is largely mountainous, some peaks reaching an altitude of nearly 14,000 feet above the sea. Besides the boundary rivers the soil is watered by their numerous affluents. It includes the towns of Ankobar (2,000), the former capital, Addis Abeba (35,000), the present capital of Shoa and Abyssinia, and Addis Alam (4,000), where the king has a residence. Up till 1889 an independent kingdom, in that year Menelek (b. 1842), its ruler, ascended the throne of Abyssinia, thereby consolidating the empire. Pop. (estimated), 1,000,000.

Shock, the group of symptoms produced by some profound impression affecting the nervous centres, either directly, as in great mental disturbance, or indirectly, as in the case of severe injury affecting the peripheral nerves. The symptoms of shock are partial or complete loss of consciousness, muscular weakness, cold, clammy skin, feeble, rapid pulse, quickened respiration, lowered temperature, and loss of control over the sphincter muscles. In the case of head injuries the variety of shock sometimes spoken of as concussion of the brain occurs. When recovery from the condition of shock sets in, a period of reaction supervenes, with raised temperature. The treatment of shock consists in the maintenance of absolute rest in the horizontal position, in applying heat by means of warm flannels, hot-water bottles, and the like, and, in certain cases, in administering stimulants, with caution, however, and always under medical advice.

Shoddy originally denoted the waste from the manufacture of wool, which in the first instance was not turned to account industrially; but afterwards this waste, together with cuttings of flannel, wool, etc., was redevilled, spun, and woven into cloth, being called new shoddy, to distinguish it from similar cloths manufactured from old clothes, this latter being called old shoddy. In the same way we have new mungo, formed from clippings of milled cloth, and old mungo, formed from old cloth. Shoddy is not so lasting as the original good material of which it may be largely composed, but is much cheaper. Since the fabric was inferior and insubstantial, the word came to be applied figuratively to persons and things that were, though pretentious and showy, vulgar, trashy and essentially worthless.

Shoe-Bill Stork (*Balaniceps rex*), a sub-family of the Stork family of the order of the Herons. It occurs only in the waters of the Upper Nile region. Dr. Brehm, the distinguished German naturalist, regards it as so characteristic of Africa that, along with the ostrich, it might be taken to typify the mysterious continent. To the Arabs it presented itself as the guardian of the sacred stream. Its popular name is derived from the resemblance which its bill offers to a shoe, while its scientific names, which mean "Whale-head" and "King," are a tribute both to its fantastic form and to the atmosphere of fable with which the bird has been enveloped. It is one of the largest of birds and preys upon fishes, frogs, lizards and the like.

Shoeburyness, or SOUTH SHOEBURY, a town of Essex, England, on the northern shore of the Thames estuary, opposite Sheerness on the island of Sheppey, Kent, with the Nore light-ship about midway, about 4 miles E. of Southend. There are artillery barracks at the fort, and it has a gunnery school and ranges for practice and for testing new ordnance. Occasionally insufficient care is shown in the seaward practice and shot has been observed to fall dangerously near shipping, possibly causing more amusement to the artillerists than to the passengers on board the *Koh-i-noor* and *Royal Sovereign*. Pop. (1901), 4,081.

Sholapur, a District in the Deccan Division of Bombay Presidency, India. It occupies an area of 4,542 square miles. The surface is flat or undulating on the whole, though there is hilly ground in the north and west. The chief rivers are the Bhima and its affluents, the Man, Nira and Sina. The principal crops are millet, oil-seeds, sugar-cane, cotton and medicinal plants. There are considerable herds of cattle and buffaloes and the sheep flocks are large. The manufactures include silk, cotton, blankets, oil and saltpetre, besides dyeing. Sholapur (74,521) is the capital. Pop. (1901), 720,976.

Shore, JANE, the mistress of Edward IV., was the wife of William Shore, who is said to have

been a goldsmith in Lombard Street. In consequence of her *liaison* with the king she was abandoned by her husband. After Edward's death she attached herself to Lord Hastings, and was accused of conspiring with him to injure Richard III. by unholy spells; but, this charge proving groundless, she was forced to do penance at St. Paul's Cathedral for her immoral life. She afterwards became the mistress of the Marquis of Dorset. She was still living in 1513, when Sir Thomas More wrote his *Life of Richard III.*, in which there is a graphic description of her beauty. She is believed to have died in poverty in 1526 or 1527, but the story of her miserable death in Shoreditch is unfounded. There is no authority for the statement that Shoreditch was called after her, the name having been in use long before her time.

Shoreham, New, a seaport at the mouth of the Adur, Sussex, England, 6 miles W. of Brighton. A suspension bridge carrying the high road to Worthing was erected across the stream in 1832 by the Duke of Norfolk. Old Shoreham, a mile inland to the north, has a remarkably picturesque timber bridge and a very interesting parish church (St. Nicholas') of flint with stone dressings, the tower and other features being of Norman date. The two Shorehams are situated on the left bank of the Adur. Ella, the first king of the South Saxons, landed at New Shoreham to effect the subjugation of England and from this port Charles II. made good his escape to Fécamp after the battle of Worcester (1651). The church of St. Mary the Virgin (restored in 1876) is the only remaining portion of a more ancient and beautiful cruciform structure. It contains some fine Transition work and the nave a three-light Perpendicular window. The trade of the port chiefly comprises coals, corn and timber, but some shipbuilding and fishing are carried on. Pop. (1901), 3,837.

Shorthand is the name given to the systems of abbreviated writing which enable a person to express his own ideas, or the ideas of others, in a much shorter time than would be practicable by the use of longhand. The modern practice of reporting speeches in full, and the great increase in public speaking, are the immediate cause of the study of shorthand, though the employment of a system of shorthand was known to the ancients (a system being ascribed to Tiro, a freedman of Cicero), and in England in the 16th century. Most people who write much employ habitually a few contractions, mostly well-recognised and legible by everyone, but for professional purposes a general system of many signs is required, which must likewise be of common knowledge, since others than the writer have to read what he has written. The system most in use is that invented in 1837 by Sir Isaac Pitman. The whole system is too complicated and too long for any attempt here at detailed description, and books on it are so easy to come by

that it is needless. Suffice it to say that sounds are classified as formed by the lips, teeth, palate, throat, and nose; that lines and curves thick and thin are used to form consonants; that the vowels are rendered by dots and dashes; that phonetics are utilised; that there are many combinations; and that many words of constant occurrence are rendered by grammalogues. Other systems are Script, which some have preferred to the Pitman system, Oxford shorthand, and the system associated with the name of Sir Edward Clarke, the well-known lawyer and politician, who, after having tested it for a long period in his private practice and other requirements, introduced it to public notice towards the close of the year 1906.

Shorthouse, JOSEPH HENRY, novelist, eldest of the three sons of Joseph Shorthouse, chemical manufacturer, was born on September 9th, 1834, in Great Charles Street, Birmingham. His parents belonged to the Society of Friends, and his mother, by teaching and example, implanted the religious principles which so deeply affected his spiritual outlook. He received a private school education, proved a diligent pupil, and revelled among books. At sixteen he entered his father's office, hampered by a distressing stammer and often longing "that the earth would open and swallow me up." Amidst the intellectual atmosphere of his home-life, with frequent travel in North Wales, Cumberland and Scotland, he grew to manhood. In 1857 he married Sarah Scott, whom he first met at the age of four in the school where nervous excitement caused the stammer. Their married life, though childless, was of unbroken happiness. Their interests were identical, and his sympathies for writers of the 17th century instinctively led him to the study of Anglicanism. In August, 1861, husband and wife were baptised together and became members of the Church of England, though this step involved the severance of some valued friendships. A serious illness in 1862 secured him ample leisure for literary study and by 1866 he was able to try to realise his wish to write a book, "If it was only quite a little book which nobody read." For ten years he worked upon it, reading it only to his wife as each page was written, finishing it at Llandudno in 1876. Two publishers declined it and for four years *John Inglesant*, in MS., lay undisturbed until its author determined to print a hundred copies for intimate friends at his own expense. A copy came into the hands of Mrs. Humphry Ward, who enthusiastically introduced it to Alexander Macmillan, by whom it was published in September, 1881. Its success was extraordinary. It won W. E. Gladstone's commendation, yet the unknown Midland manufacturer remained unspoiled by his sudden fame. Probably his father's appreciation pleased him best of all. Already a classic it is interesting to hear Shorthouse describe its motive: "The book is a protest on

behalf of culture of every kind against fanaticism and superstition in every form." But admirers should not neglect Lord Acton's (*Letters to Mary Gladstone*) praises and complaints. The book has overshadowed his later works, *The Little Schoolmaster Mark* (1886); *Sir Percival* (1886), its author's favourite; *The Countess Eve* (1888), and *Blanche, Lady Falaise* (1891). The last three years of his life were full of suffering. He was relieved from the cares of business by his brother, and death came "gently as a friend . . . into the house at eve" on March 4th, 1903. His *Life*, edited by his widow, was published in 1905.

Short Sight. [EYE: *Errors of Refraction.*]

Shoshone Falls, a magnificent cataract of the Snake River, Idaho, United States. The river flows in a deep cañon between precipitous walls of volcanic rock, which are 1,000 feet high where the Snake takes its single leap of 210 feet, the width of the stream at the point of the descent being almost 1,000 feet. The leap is 40 feet greater than that of Niagara Falls, which are, however, of wider expanse and, owing to their surroundings and situation, more imposing and more majestic, if less forbidding, than the Shoshone cataract, which ranks next to them in North America. Some four miles farther up the Snake occur the Little Shoshone Falls, the stream, parted by a huge rock, falling in two cataracts a distance of 180 feet. The word is pronounced in three syllables (Sho-sho-nee).

Shoshonean ("Snake") Indians, a widespread North American people, whose domain extends from Oregon, California, and Idaho in a south-easterly direction through Nevada, Utah, Colorado, parts of New Mexico and Texas, nearly to the Gulf of Mexico. Formerly parts of Montana, Wyoming, Indian Territory, and even Kansas and Arkansas were also occupied by this great family, all of whose members speak dialects of a common stock language. The principal branches are: Shoshoni and Bannock (3,092), chiefly in Fort Hall Reserve, Idaho, with a considerable number in Wyoming and some in Nebraska; Chemehuevi, Comanche, and Tobikhar (4,000), in various Colorado, Arizona, Indian Territory, and Californian Agencies; Ute (2,700), in Colorado and Utah Agencies; Paiute, Paviotso, Tusayan (Moki) 8,730, still at large in Oregon, California, Nevada, and New Mexico. Their numbers throughout the States do not fall far short of an aggregate of 19,000.

Shot, in artillery, denotes any solid projectile discharged from a cannon. All shot, however, is not absolutely solid, since the so-called Palliser shot has a cavity within it containing powder or other explosive substance, and this is exploded by force of impact, no fuse being employed. The introduction of longitudinal shot has almost rendered obsolete such combinations as bar-shot, chain-shot, canister, and grape. In the first of these, two shots were

joined by an iron bar, in the second by a chain; canister was a hollow ball or canister containing a number of bullets, which were scattered by the discharge; and grape consisted of a number of bullets connected like grapes on a stem. Shot for sporting-guns varies in size from buck-shot, the size of a pea (during W. E. Forster's tenure of the Irish Secretaryship in 1880-2 he bore the odious nickname of "Buckshot Forster"), to the smallest dust-shot. The uniformity of the shot is obtained by dropping the molten lead from a height into a tub of water, arsenic being sometimes added to give a greater degree of hardness. The shot towers on the Surrey side of the Thames are conspicuous and not unpicturesque features in the London riverside scenery. The shot is sorted by being rolled over sloping sieves which have various-sized round orifices which just fit the different types required and reject imperfect shots. Having been thus sorted, they are polished by being placed in rotary barrels containing a certain quantity of black lead.

Shottery, a village of Warwickshire, England, one mile west of Stratford-on-Avon. It may be reached by a pleasant walk across the fields. It is mainly memorable for the cottage in which resided Anne Hathaway before she married William Shakespeare. The cottage, a beautiful example of a thatch-roofed dwelling, stands in a garden of old English flowers and is in an excellent state of preservation. It belongs to the Shakespeare Trust, to which has been committed the custody and maintenance of the buildings in Stratford identified with the life-history of the dramatist.

Shotts, a parish and village of North-East Lanarkshire, Scotland. The village is fully 5 miles E. by S. of Airdrie. It contains great iron and coal works. It was the birthplace of Janet Hamilton (1795-1873), the self-taught poetess, who contributed several of her compositions in prose and verse to the earlier publications of John Cassell. The place is said to have been first called Bertramshotts, "shot" being Saxon for ground and the identity of Bertram being now untraceable. The parish church stands close to the site of the old church of St. Mary and St. Catherine of Siena, erected in 1450 and demolished about 1819, and a well near the church is still called Kate's Well. Pop. of parish (1901), 15,562.

Shoulder Joint, the ball-and-socket-joint which is formed by the articulation of the rounded head of the humerus with the glenoid cavity of the scapula. In popular language, the shoulder-blade, collar-bone and arm-bone constitute the shoulder joint. The shoulder is a joint which is not infrequently dislocated; indeed, it is said to be more frequently involved in this accident than all the other joints together.

Shovell, SIR CLOWDISLEY, admiral, was born at Cockthorpe, Norfolk, England, in 1650.

Many of the Shovells and the Clowdisleys (his mother's folk) served in the Navy and so to sea this young Shovell went in 1664. He speedily rose through the humbler ranks, served as lieutenant under Sir John Narbrough against Tripoli (1676). He was present at the actions in Bantry Bay (1689), after which he was knighted, and off Beachy Head (1690), and took a very prominent part in the battle of La Hogue (1692). He subsequently served under Sir George Rooke in the Mediterranean, and in 1705 became Commander-in-chief of the British Navy, co-operating in that capacity with the Earl of Peterborough (1705-7). During his voyage back to England his fleet was borne by strong westerly winds and the action of the currents (not then understood) amongst the Scilly rocks. Most of the ships escaped destruction with difficulty, but the *Association*, carrying Shovell's flag, and two other vessels were wrecked (October 23rd, 1707). Nearly thirty years later a woman on her death-bed confessed that when Shovell's body came ashore life was not yet extinct, but that she had quenched it in order to secure the emerald ring he wore.

Shoveller, a bird belonging to the genus *Spatula*, of the Duck family, with five species, which are found in the temperate regions of both the Old and the New Worlds. They are met with as far south as India in the Jue and Guatemala in the other. The hind-toe is free, and the bill greatly expanded at the tip, from which feature is derived its scientific name. The Common Shoveller (*S. clypeata*) visits Great Britain in the winter. The plumage of the male is boldly marked with white, and is handsomely coloured; that of his mate is uniform liver-brown. The bird is reckoned one of the best ducks for the table, though its habits in India—where it may be seen on the banks of the foulest ponds—would not lead one to fancy it. In the British Isles, however, it is a shy bird, avoiding the society of man (for good and sufficient reasons), and is as unobjectionable as any other waterfowl that falls to the gun.

Showbread, or SHEWBREAD, amongst the Jews, the bread which was placed every Sabbath before Jehovah on the table of shittim-wood (acacia) overlaid with gold, set in the holy place, on the north side of the altar of incense. Golden urns containing frankincense stood beside the loaves. The bread was made of fine flour, unleavened, the dough being mixed with water only. It was baked in a chamber on the north side of the temple court in loaves moulded in the shape of a brick of considerable size. They were twelve in number, corresponding to the twelve tribes of Israel, and were stacked on two salvers, six on each. They remained on the table for a week. On the Sabbath four priests of the retiring rotation removed the week-old bread and frankincense, followed by four of the incoming rotation, two carrying salvers with the new loaves and two

the urns of fresh frankincense. Each set of priests, however, was scrupulous to effect the change so that not even for a moment was the table destitute of bread. The old frankincense was burned on the great altar and the old loaves were eaten within the sanctuary precincts by the outgoing and incoming priests, a share being reserved for the high priest.

Shrew, an animal belonging to the Insectivorous family Soricidæ, with several genera, very widely distributed but absent from Australia. In appearance they resemble rats and mice, from which they may be distinguished by the presence of canine-like teeth and the character



SHREW.

of the incisors, and by their long pointed muzzle. In habit they are usually terrestrial, though some are aquatic. Scent-glands are present. The type-genus (*Sorex*) has two British species. The Common Shrew (*S. vulgaris*) is about the size of a mouse, with brownish fur above and greyish below. It ranges eastwards through Europe and Asia to North America. It is found in dry places in the open country and in gardens, and feeds on snails, slugs, worms, and insects. These creatures are very pugnacious, and when two meet a fight generally ensues, and the weaker is killed and eaten. In late summer and autumn, probably owing to scanty food-supply, numbers of shrews are found dead, but showing no signs of injury. Moles, weasels, owls, and cats will kill shrews, though puss will rarely eat them. Shrews have been the subject of many superstitions. If they bit a cow (which they were not at all likely to do) the animal would swell at the heart and die. If one ran over the leg of an animal, lameness and great pain would be produced. The cure for such dreadful ills was, as might be expected, based on cruel credulity. The part affected was to be treated with a twig of shrew-ash, made thus: a hole was bored in the tree and a shrew was put into the hole, which was then sealed up. Their mysterious deaths formed the price paid by the shrews for crossing a public path. The Lesser Shrew (*S. pygmaeus*) is smaller, and less common in Great Britain than the first species, and is, in fact, the

smallest British mammal. It extends to Ireland, from which country *S. vulgaris* is absent, as is the Water-Shrew (*Crossopus fodiens*), much larger than the Common Shrew, and having the feet fringed with stiff hairs. It burrows in the banks of rivers and lakes, and feeds on small crustaceans, insects and their larvæ, and fish-fry, though it has been accused of carnivorous propensities and even of the horrible habit of eating out the eyes and brains of large fishes like carp and so destroying them. From Great Britain it ranges eastwards to the Altai Mountains. Aberrant forms of the family are the mole-like tailless shrews from Tibet and Assam, and the Tibetan Water-Shrews, with webbed feet and adhesive pads on their under-surface. [MUSK-SHREWS.]

Shrew Moles, a popular name for some moles from North America which have the muzzle elongated and the hind-feet webbed. The Shrew Mole (*Scalops aquaticus*), sometimes called simply the Mole, and the Prairie Mole (*S. argentatus*) are widely distributed in the United States. The latter is also known as the Silvery Shrew Mole, because its hair is disposed in a ringed fashion of white and lead colour, which gives it a silvery aspect. The Texan Shrew Mole (*S. latimanus*) is a very large creature, exceeding seven inches in length, and is confined to Texas and Mexico. Two other Shrew Moles (Brewer's Shrew Mole and the Oregon Mole), though resembling the others in general character, have been placed in a distinct genus (*Scapanus*), because they agree with the Star-nosed Mole (*Condylura cristata*) in having forty-four teeth, whilst the Shrew Moles possess only thirty-six.

Shrewsbury, the capital of Shropshire, England, on a bend of the Severn, here crossed by several bridges, 30 miles S. of Chester. Under the name Pengwern ("alder hill"), it was founded in the 5th century as a Border fortress, held high rank among Saxon cities, by whom it was called Scrobbesbyrig ("the town in the wood"), of which the present name is a corruption, and after the Conquest played an important part as the seat of several Parliaments. It was the scene of the battle of July 21st, 1403, in which Harry Hotspur fell, and the headquarters of Charles I. in 1642. The castle built by Roger de Montgomery in 1083 was captured by the Roundheads in 1645, partially dismantled by James II., and is now to some extent in ruins, two drum towers of the time of Edward I., however, still remaining. The church of the Holy Cross was the conventual church of the Benedictine abbey erected in 1087. St. Alkmund's was rebuilt in semi-Classic style in 1795, with the exception of the Perpendicular tower. Of the old church of St. Chad only the chantry chapel, not now used, is extant, but a new St. Chad's was built on another site in the Classic style in 1792. St. Mary's Church of Norman, Early English and other periods has a Jesse window. The only surviving part of the old St. Julian's

Church, dating from before the Conquest, is the tower, partly Norman and partly Perpendicular, the structure otherwise having been rebuilt in 1748. The Roman Catholic Cathedral (1856) was designed by Augustus Welby Pugin. The Grammar School, one of the great public schools of England, was founded in 1551 by Edward VI., opened in 1562, enlarged by Elizabeth in 1571, and transferred to its present quarters in Kingsland in 1882. It owes much of its fame to the headmasterships of Dr. Samuel Butler (1798-1836), afterwards Bishop of Lichfield, and Dr. Kennedy (1836-66). The old school-buildings are now tenanted by the County Museum and Free Library. Other noteworthy buildings are the fine old market-house (1595), the new market hall, the council house, the infirmary, the Eye, Ear and Throat Hospital, Drapers' Hall, and other examples, in admirable condition mostly, of the black and white half-timbered houses (in High Street and elsewhere), so characteristic of many of the towns of the Welsh marches. Amongst the monuments are the statues to Charles Darwin, who was born in the town in 1809, and to Lord Clive, who represented the town from 1761 to 1774 after his memorable career in India, and the Doric column, 133 feet high, commemorating the achievements of Lord Hill (a Shropshire man) in the Peninsular War. The industries include brewing and malting, tanning, glass-staining, iron-founding, agricultural implement-making, the making of brawn, Shrewsbury cakes, thread, linen and canvas. There is a considerable catch of salmon here. Pop. (1901), 28,396.

Shrike, any bird of the Passerine genus *Lanius*, with fifty species, universally distributed except in South America. The bill is hooked,



RED-BACKED SHRIKE.

short and stout, the upper mandible bearing a strong tooth, and their feet are powerful. They are chiefly insect-eating birds, but sometimes prey on mice, young frogs and lizards, and small birds, and, from their habit of impaling their prey on thorns, are often called Butcher-Birds. The collection of their victims thus spitted is popularly known as the Shrike's Larder, and it was the ferocity

of their habits that induced Linnæus and other older naturalists to classify them in close proximity to the birds of prey. The Red-backed Shrike (*L. collurio*) is a well-known summer visitor to Great Britain, though somewhat local; it migrates when the brood is reared. The Lesser

Grey Shrike (*L. minor*) is an occasional, and the Great Grey Shrike (*L. excubitor*) a regular winter visitor. The latter is about 9½ inches long and is of a light blue-grey colour, its cheeks and under surface being white, its wings black dashed with white, and its tail black with white feathers at the outer edge of its sides. It is a pertinacious hunter and seldom allows itself to be balked of its prey. It is attracted to its victims by hearing as well as by sight, and is said to be able to discriminate between the call-notes of young and of old birds. The Thickheads, which are the representatives of the family in Australia, appear to be much shyer in their habits than their European relatives and to be much more addicted to insectivorous ways. Some of the males are attractively coloured, a rich yellow being the predominant note in the dress of the Grey-tailed Thickhead.

Shrimp, THE COMMON (*Crangon vulgaris*), a familiar crustacean that frequents the shallow water of the coasts of Great Britain and other temperate countries in the northern hemisphere. It is about two inches long, of fragile structure and almost translucent, and grey speckled with brownish dots. It is admirably protected from danger by its resemblance in colour to the sandy bottom where it lives and in which it buries itself adroitly to avoid capture. It hides during the day to escape the vigilance of fishes and can afford to do this, quite apart from the habit being a necessity of existence, since it detects its food by scent and is thus enabled to hunt during the night. In England it has long been regarded as a tea-table delicacy, and boils to a brown colour. It is taken in roomy nets with close meshes, the fisherman wading in the sea and pushing in front of him the wooden framework from which the capacious wide-mouthed bag is suspended.

Shropshire, or SALOP, a western inland county of England, bounded on the N. by Cheshire and a detached portion of Flintshire, on the E. by Staffordshire, on the S.E. by Worcestershire, on the S. by Herefordshire, on the S.W. by Radnorshire, on the W. by Montgomeryshire, and on the N.W. by Denbighshire. It occupies an area of 1,346 square miles. On the west, in the south and south-west and here and there towards the centre, the surface is mountainous, the chief heights being Brown Clee (1,805 feet) and Titterstone Clee (1,750) of the Clee Hills in the south, the Stiperstones (1,759), the Long Mynd (1,674), Wenlock Edge and Clun Forest in the south-west, and the sugarloaf peak of the Wrekin (1,342) to the north of Coalbrookdale. The dominant river is the Severn which enters from Wales near Melverley, flows eastwards to beyond Shrewsbury and then takes a bold sweep towards the south-east leaving the county for Worcestershire at the forest of Wyre. Its Salopian affluents include, on the left, the Vyrnwy, Perry, Tern (with the Roden), and Worf and, on the right, the Meol (with the Bea), Cound, Mor and Borle. Other streams

are the Clun, Corve and Rea tributaries of the Teme, which itself almost wholly avoids the shire. The mineral wealth comprises coal (the principal fields being Coalbrookdale, Forest of Wyre, Shrewsbury, Clee Hills and Oswestry), iron, lead, barytes and fire-clay, and there are extensive quarries of lime and freestone. The land in the valleys is fertile, the leading crops being oats, wheat, barley, turnips, potatoes, mangolds, beans and peas. Orchards are numerous and dairy-farming flourishes, Cheshire cheese being largely made. There is much pasture land for cattle, sheep, pigs and horses, all raised in considerable numbers. The industries include iron-founding, the mining of coal, iron and barytes, woollens, pottery, porcelain and earthenware, tobacco pipes, bricks and tiles, the making of machinery, agricultural implements, tools and vehicles, linen, thread, yarn and paper. Shrewsbury is the capital and among larger towns are Wellington, Wenlock, Oswestry, Bridgnorth, Much Wenlock, Madeley, Broseley, Newport and Ludlow. The county was originally occupied by the British tribes called by the Romans the Ordovices and Cornavii, and Caractacus (Caradoc) made his last stand against Vespasian (A.D. 50) at Caer Caradoc in the forest of Clun, two miles north of the Teme. Watling Street, the famous Roman road, entered from Staffordshire at Weston-under-Lizard and Wroxeter, is built on the site of the Roman Uriconium and has yielded many interesting relics. Of the dyke which Offa, the Mercian king, built in 780 against the encroachments of the Welsh, many portions yet remain, roughly following the Montgomeryshire border. Most of the general history of the county centres round Shrewsbury. Pop. (1901), 239,783.

Shrove Tide is the name given in England to the time immediately preceding Lent, and is generally applied only to the Tuesday (Shrove Tuesday) before Ash Wednesday. The name is derived from the old custom of going to confession, or of being shriven, on that day, which was regarded as a fast. Hence the custom of eating pancakes on Shrove Tuesday; but in modern times carnival festivities have ousted the fast. In Germany the day is called Fast Nacht, and in France Mardi Gras.

Shumla, a fortified town of Bulgaria, conspicuously situated on the northern outliers of the Eastern Balkans, 50 miles W. of Varna, a port on the Black Sea. Its position is of great strategic importance, because it is the converging point of the roads from the Danubian strongholds of Rustchuk and Silistria and also from the fortresses of the Dobrudja for the passes across the Balkans to Slivno, Adrianople and the south. As a Turkish fortress it successfully withstood the Russian assaults of 1774, 1810, and 1828, but changed masters on June 28th, 1878, when it was handed over to the Russians at the close of the Russo-Turkish War. Turks yet form a considerable portion of the community, and own several mosques, the

remainder of the inhabitants being mostly Bulgarian and Armenian Christians and Jews. The industries comprise weaving, tanning, the making of red and yellow slippers and richly embroidered dresses for women, and the fabrication of goods in copper and tin. Pop. (1901), 22,928.

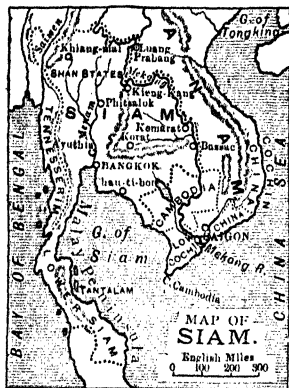
Siah-Posh Kafirs ("Black-clad Infidels"), the pagan inhabitants of Kafirstan on the southern slope of the Hindu Kush, so called by their Mohammedan Afghan neighbours. There appears to be no collective national name, though Kamoji, that of the most important group, is sometimes applied to the whole people; nor are there any true tribal divisions, or at least those that do exist are of topographical origin, as was perhaps inevitable from the physical character of their country. Such are the Vaigal, Rangal, and Bashgal, answering to the three principal river valleys, with a total estimated population 600,000, under their own chiefs. Their speech is a Galcha language, intermediate between Iranian and Sanskrit, and occurs in ten different varieties. The people are of distinctly Caucasian type, with regular features, blue and dark eyes, hair of all shades between light brown and black, broad open forehead, tall stature, shapely figures; but General Abbot distinguishes between this noble type, that of the aristocracy (who claim descent from the Macedonian conquerors), and a very dark type, that of the non-Aryan aborigines.

Sialagogue, a substance which promotes salivary secretion. There are two classes—topical and remote. The former include dilute acids, ginger, rhubarb, mustard, horse radish, tobacco and the sight and smell of savoury dishes, and act by exciting a salivary flow through the sensory nerves of the mouth. Remote sialagogues comprise, amongst others, jaborandi, mercury, physostigmine, iodide of potassium and tobacco, and act by stimulating the secretory nerves of the salivary glands. Increased flow of saliva may be necessary to facilitate mastication, to ease the movement of the tongue in speaking, to assist and promote digestion (since it not only has a digestive power on starch, but also stimulates the increase of the gastric juice), to relieve parched throat, and to alleviate the pain and reduce the congestion of toothache and earache.

Sialkot, a District in the Rawalpindi Division of the Punjab, India, forming an oblong tract occupying the submontane portion of the Rechna or Ravi-Chenab doab, measuring fully 50 miles from south-east to north-west, with an average breadth of 44 miles and covering an area of 1,991 square miles. Besides the two boundary rivers mentioned, the chief stream is the Degh. The surface is, on the whole, a level plain presenting, in consequence of its proximity to the Himalaya, a greener aspect than is usual in this part of India. There are no minerals excepting limestone nodules, salt-

petre and potter's clay. The scanty fauna includes a few wild hogs, wolves, antelopes, quail and waterfowl. The principal crops are wheat, barley, maize, millet, rice, sugar-cane, pulse, oil-seeds, vegetables and tobacco. The livestock, though considerable, does not suffice for local needs and cattle are imported. The manufactures comprise, among other things, damascene work, shawl-edging, chintz, pottery, silk, saddlery, cloth, brass vessels, cutlery and paper. Sialkot (57,956) is the capital. Pop. (1901), 1,084,515.

Siam, a kingdom occupying the central part of the Indo-Chinese, and extending into the Malay Peninsula, being bounded on the N. by the Shan States, on the W. by Burma, on the E. and N.E. by Anam and Tonking (French territory), and on the S. by Cambodia (also owned by France) and the Gulf of Siam. The limits in the Malay Peninsula may be defined by an imaginary line bounding the southern parts of Kelantan, Patani and Kedah. It occupies an area of 220,000 square miles. In 1896 an arrangement was agreed to, and confirmed in 1904, between the United Kingdom and France, by which



SKETCH-MAP OF SIAM.

they guaranteed to Siam the integrity of the territory embraced in the basins of the Menam, Mekong, Peshaburi and Bangpakong rivers, and by which France was confirmed in the possession of Cambodia; and Siam is practically confined to the valley of the Menam. This is the most fertile part of the kingdom, the alluvial soil, watered by yearly floods, yielding an inexhaustible supply of rice, which is brought down the stream to Bangkok for shipment. To the west of this valley the Mewang and Meping bring their tributary waters through a more rugged country embracing several rich plains, whilst close to the Burmese frontier the Toongyeen, flowing north, waters teak forests and cinnamon groves. To the east of the Menam there is much sterile and sandy land (the Korat plateau), with swampy and unhealthy river-flats at intervals. This plateau is bounded on the south by a range stretching into Cambodia, and famous for precious stones, especially rubies and sapphires, whilst the mountains to the north contain many valuable minerals, the natives only extracting a little iron. Tin is found in considerable abundance in the Malay Peninsula and other parts. Gold is obtained both by mining and washing; lead, silver, iron,

antimony, zinc, manganese and copper are abundant, but little worked. Besides rice (the national food and staple export), other products are pepper, sesame, cattle, salt, dried fish, hemp, tobacco, silk, cotton, coffee and teak, in the piling of which the elephant plays such a useful part. There is some trade by caravans through the Shan States with Yunnan and China. The climate is enervating and in the rainy season malarial fever is prevalent. Big game still abounds, including the elephant, tiger, leopard, honey-bear, sloth-bear, rhinoceros, wild hog, gaur and water buffalo, but several kinds of bat, monkey, and snake (some poisonous) are met with, besides the crocodile and water monitor. Buddhism is the national religion. Despite the efforts to suppress slavery, the institution occasionally rears its hideous head. The white elephant is the national emblem. It is, of course, an albino and, partly in consequence of its rarity and principally as the incarnation of Buddha, is regarded with great veneration. Its colour, according to Sir John Bowring, is a dull brownish yellow, white only by contrast. Even this, however, is a good deal lighter than that of the elephant which P. T. Barnum bought of King Theebaw of Burma and which he allowed to be on exhibition at the Zoological Gardens in London in 1884 on its way to New York. Save for patches of pink on its ears, part of its face, trunk and fore knees, it could not be described as different from an ordinary elephant. It stood seven and a half feet high and was a shapely beast with a pair of beautiful tusks—the only white things about it. Nevertheless in Siam the creature is considered to be sacred and therefore almost priceless. To possess one is more honourable than the renown of conquest of territory or victory in battle. The government is a monarchy, nominally but not necessarily hereditary, the sovereign being entitled to nominate his successor. The old office of "second king," the functions of which were too intangible for coherent definition, is extinct. The king is advised by a cabinet of several ministers of departments and there is a Legislative Council, consisting of the State ministers, at least 12 nominees of the Crown, and an indefinite though not too great number of other members. In the event of temporary disability of the Crown, this Council has the power to promulgate laws without the Royal assent. The Siamese dominions are divided into provinces or districts, each administered by a Commissioner aided by a subordinate governor. Siamese interests as a whole are committed to the Minister of the Interior. Besides Bangkok (pop. from 400,000 to 600,000) the capital, Chantabun, Meklong, Paklat, and Paknam are important coast towns, Kiang-Kong on the upper Mekong, Phitsalok and Ayuthia on the Menam, Raheng and Lapoon on the Meping being the chief places inland. Siam was first visited by Europeans in 1511, but it was not until 1856 that the Siamese relaxed their exclusive policy, and since that date British interests on the

west and French in the east and south-east have acquired great importance.

Ethnology. The dominant inhabitants of Siam call themselves Thai ("Free," "Noble"), and are a branch of the widespread Shan race, Siam being merely a corrupt form of Shan through the Portuguese Siao. The Siamese proper, most civilised of all the Shan peoples, are concentrated chiefly in the Menam basin and in the Malay Peninsula as far south as about 8° N., where they are continuous with the Malay race. They retain in a somewhat modified form all the physical traits of the Mongoloid Shans: broad features, high cheekbones, small nose, slant eyes, black lank hair, beardless face, small stature, olive complexion. Their culture has been developed under Hindu influences, their monosyllabic Indo-Chinese language being largely charged with Sanskrit elements and written in a syllabic alphabet derived through the Pali from Devanagari; hence a corrupt form of Buddhism is the prevailing religion. Of the inhabitants of Muang-Thai ("Land of the Free"), as Siam is officially called, not more than 2,500,000 are Siamese proper, the rest being Laos (Eastern Shans), about 2,000,000; Chinese, 1,500,000; Malays, 1,000,000; Cambojans, 300,000; Burmese, Talains, Karens, and wild tribes, 700,000; but since the cessions to France in 1893 these figures are said to have been considerably reduced, and the present population is variously estimated at from five to ten millions.

Siamese Twins, a *lusus nature*, born in Siam, of Chinese parents, in 1811. They were males, and were called Eng and Chang respectively, and were for many years exhibited in different parts of the world. Their bodies were united by a band of flesh and cartilage containing certain inter-communicating vessels. The brothers were 5 feet 2 inches high, were well made and muscular, and could lift a weight of 20 stone. They were active, swam, walked and ran, and played chess and draughts. In many respects they were one, and their emotions, impressions, and wants were in common, so that they had little need to speak to each other. On the other hand, towards the end of his life Chang took to drinking, and could get drunk without affecting Eng, and the latter was not aware of Chang's death (on January 17th, 1874) till he woke, he himself dying within three hours afterwards, it is said, of mental shock caused by Chang's death. An elaborate post-mortem examination was made. Both men were married and had children.

Sibbes, RICHARD, Puritan divine. was born at Tostock, Suffolk, England, in 1577, and educated at the Grammar School of Bury St. Edmunds and St. John's College, Cambridge. Having taken holy orders he was, in 1610, appointed to the lectureship at Holy Trinity, Cambridge, a position of which he was deprived five years later in consequence of his Puritanism. In 1617 he was elected preacher at Gray's Inn, London, and, in 1626, became master of

St. Catharine's Hall, Cambridge. In 1629 appeared his *Saint's Cordials* and, in the following year, *The Bruised Reede and Smoaking Flax*, the book to which, so it is said, Richard Baxter owed his religious impressions. In 1634 he published *The Saint's Safetie in Evil Times* and *The Churches Visitation* and, in 1635, *The Soules Conflict*. He died at Gray's Inn on July 5th, 1635. Several volumes of sermons and other devotional works were issued after his death.

Siberia (Russian, Sibir), a vast territory in Asia, comprising roughly the northern half of the continent and forming the major part of the Russian empire in Asia, bounded on the N. by the Arctic Ocean, on the E. by Bering Sea, the Sea of Okhotsk and the northern part of the Sea of Japan, on the S. by China (Manchuria and Mongolia) and the Provinces of the Steppes (Semipalatinsk, Akmolinsk, Turgai and Uralsk) and on the W. by Russia in Europe and the Ural Mountains. It is divided into the provinces (pr.) and governments (gov.) of Tobolsk (gov., 535,739 square miles), Tomsk (gov., 327,173), Yeniseisk (gov., 981,607), Irkutsk (gov., 280,429), Yakutsk (pr. 1,530,253), Transbaikalia (pr., 229,520), Amur (pr., 172,826), Primorskaya or the Maritime Province (712,585), and the northern half of the island of Sakhalin (about 15,000 square miles, the southern half being ceded to Japan on September 5th, 1905: the total area of the island is 29,336 square miles). It covers an area of 4,785,132 square miles, and lies between 59° E. and 170° W. (Cape Dezhnev or East Cape) and between 50° N. (42° N. at Vladivostok in Primorskaya) and 77° 40' N. (Cape Tchelyuskin, the most northerly point of the mainland of the Old World). The northern sea was successfully navigated for the first time by Baron Nordenskiöld in the *Vega* in 1878. Sailing eastwards he wintered off the coast of Siberia and in the early summer of 1879 made Bering Sea and proceeded thence to Sweden by the Japanese and Chinese Seas, the Indian Ocean and the Suez Canal. The surface may be broadly divided into four zones, namely, the mountainous south-east, the belt of prairie and steppe to the north of this, the marsh lands still farther north, and, in the extreme north, the terrible tundras or water-logged plains (frozen for half the year), which are interesting, however, to natural history as having yielded the mammoth in an excellent state of preservation. The chief mountains are the Stanovoi (the highest points of which exceed 8,000 feet) in the Amur province, which are continued westwards by the Yablonoi (highest points about 9,000 feet) in Transbaikalia, the Sayan group (9,000 feet highest point) separating Mongolia from Irkutsk and the Altai, reaching in Bielukha or White Mountain a height of 14,800 feet and in the Pillars of the Katunya a height of 12,800 feet, or possibly even 15,000 feet. To the east of the Lena are the Verkhoyansk and Kolyma Mountains, not exceeding 5,000 feet, and in the peninsula of

and topaz. It is impossible to say with any exactness what is the extent of the mineral riches, for they have not been developed in other than a crude manner. There can, however, be little doubt but that Siberia will prove to be one of the grandest mineral regions on the earth's surface. In many mines are employed a large number of the exiles that have made Siberia a byword in civilisation, the only offences which the vast majority of those unfortunate creatures have committed being either political or religious. The Transiberian railway is the longest in the world, there being through-communication from St. Petersburg and Moscow *via* Samara, Kurgan, Omsk, Tomsk, Irkutsk, round the southern end of Lake Baikal (completed in 1904), to Strelensk, where the line branches to Vladivostok in one direction and to Port Arthur and Peking in a more southerly direction. It was begun in 1891 and practically completed in 1904, though capable of indefinite extension by means of branch lines. From St. Petersburg to Port Arthur the full length is 5,620 miles. Two-thirds of the population are Russians and the remainder consists of Turkish Tatars (Yakuts), Mongolians (Kalmucks, Buriats and Tunguzes), Jews, Chinese, Japanese and Korean settlers, and Hyperboreans (Ainus in Sakhalin, Koriaks and Kamtchadales in Kamtchatka, Yukaghirs, Chukchis, Ghilaks and Eskimo in the far north-east, and Samoyedes and Finns in the far north). The Russians profess the Greek-Orthodox faith, or various Dissenting aspects of it, the Turks are Mohammedans, the Mongolians mostly Buddhist and the Samoyedes and Hyperboreans Shamanists. In the order of their population the principal towns are Tomsk (63,533), Irkutsk (49,106), Vladivostok (38,000), Blagovychensk (37,368), Krasnoyarsk (33,337), Barnaul (29,850), Tyumen (29,651), Nikolsk (22,000), Tobolsk (21,401), Irbit (20,064). Russia's connection with Siberia dates from 1580, when Cossack marauders ousted the Tatar occupants and effected settlements on the Tobol and Irtysh rivers. These, however, were only *points d'appui* for further incursions to north, east and south. By 1618 the town of Yeniseisk was founded, and by the end of the 17th century the eastern seas were reached and Kamtchatka was annexed. The Amur estuary was discovered in 1849 and the boundary with China was delimited between 1857 and 1860. As a result of the war with Japan, which ended in 1905, Russia ceded to Japan the lease of Port Arthur and certain adjacent territory, the railway between Chan Chun and Port Arthur and the northern half of Sakhalin, and her sphere of influence in the extreme far east was circumscribed and crippled. Pop. (1904), 6,493,400.

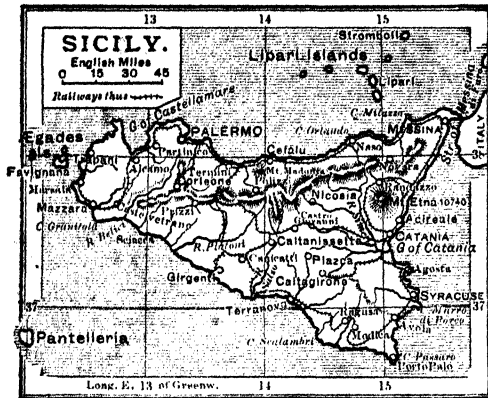
Sibyl, a name given to certain prophetic virgins—ten or more in number—of ancient times, the most noted of whom was She of Cumæ. This sibyl it is who is said to have offered the nine

sibylline books to King Tarquin at a certain price. He declined to purchase them at the extortionate figure demanded, whereupon she burnt three, and offered the remaining six at the same price. Again he refused, and again she burnt three, finally offering the three left at the original price. The king was impressed by her singular perseverance and consented to acquire the books. They were examined and, being discovered to contain prophecies of the fortunes of Rome, were deemed to be so valuable that first two and then ten priests were appointed to take charge of them and study their interpretation. The keepers were afterwards increased to fifteen. In 83 B.C. the books with the Temple of Jupiter on the Capitoline Hill, in which they were preserved, were burnt. Researches for others were made in different countries, the result being that about 1,000 sibylline utterances were discovered. They were revised from time to time to eliminate forgeries, and were more than once in danger of destruction by fire; and even as late as A.D. 270 it was proposed that they should be consulted. A supposed collection of those remaining was published at Amsterdam in 1689.

Sicilian Vespers is the name given to a massacre of the French in Sicily in 1282. Charles of Anjou, who was king of Naples and Sicily, governed tyrannically, and a certain Giovanni di Procida went to Peter of Aragon, who had married Constantia, daughter of Manfred, and invited that king to attack Charles, promising aid both in men and money. Peter consented, and fitted out an expedition, ostensibly against the Moors of Africa. Meanwhile, on March 30th, 1282, all the French in Palermo were massacred, the vesper bell being the signal. This example was followed by Messina and other towns. Charles thereupon laid siege to Messina, but the approach of Peter compelled him to raise the siege and flee. Constantia's rights were acknowledged, and the crown was settled upon her second son. The crowning outrage which precipitated the colossal massacre—the number of victims amounting to 8,000, neither age nor sex being spared—was said to have been the infamous insult offered by a French soldier to a young Sicilian bride.

Sicily, an island of triangular shape (hence its classical name of Trinacria, or three-cornered, the three corners being Cape Faro in the north-east, Cape Passaro in the south-east, and Cape Boeo in the west), in the Mediterranean at the south-western extremity of the Italian peninsula, from which it is separated by the Strait of Messina, only 2½ miles broad at its narrowest. From east to west the island measures about 185 miles, the distance between extreme north and south being 120 miles and the total area 9,828 square miles, or, including the adjacent islands of the Ægades, of the Lipari or Æolian group and Ustica, 9,935 square miles. Cape Passaro is only 56 miles north of Malta and Cape Boeo 80 miles north-east of Cape

Bon in Tunis. The interior is very mountainous, for the Peloric and Nebrodi ranges, extensions of the Apennines, rise to the height of several thousand feet (to 6,467 feet in Pizzo d'Antenna), and there are detached masses such as Etna, the still active volcano (10,874 feet), in the south-east. Fine plains, however, spread here and there along the coast, possessing the



SKETCH-MAP OF SICILY.

deepest and richest alluvial soil, and each with a good harbour—e.g., Palermo and Castellamare in the north, Catania and Syracuse in the east, Terranova in the south, and Trapani and Marsala in the west. Lentini, about 7 miles from the Gulf of Catania, is the only lake of considerable size in the island and its area is only about $4\frac{1}{2}$ square miles. The rivers are really mountain torrents and not navigable. In nearly every district even tropical fruits will grow, and the island served as the granary of ancient Rome. Wine is abundant. The uplands feed merino sheep, but the old pastoral habits have decayed. Mules and asses are raised in great numbers as beasts of burden and cattle for labour. There are valuable forests on the flanks of the mountains, and the great mineral wealth remains almost unexplored, though sulphur, alum, nitre, rock-salt, and marble are exported in addition to the olive-oil, white wine, oranges, lemons, raw silk, barilla, and fish that form the staples of trade. Mining and agriculture are the leading industries, manufactures having been paralysed by many years of past misgovernment, of brigandage, religious mendicancy, priestcraft, and by the recurrence of earthquakes. The lawless secret society of the Mafia and the primitive Vendetta are abominations that still disturb public tranquillity. Serious troubles have occasionally arisen through the system of local administration, which presses severely on the agricultural classes, and from the pernicious system of land tenure, involving much sub-letting. Sicily first appears in history as the seat of the pre-Aryan Sicani, who were, in the 11th century

B.C., reinforced by the Aryan Siculi. Then the Phoenicians made settlements in different parts and after them, in the 7th and 6th centuries B.C., came Greek colonies. The island played an important part in the struggle between Athens and Sparta, and also in the history of Rome until reduced to a province at the end of the second Punic War (202 B.C.), though for a long period before this Syracuse had grown famous under the rule of several able and enlightened Tyrants. After the collapse of the Empire Sicily fell for two centuries into the hands of the Saracens, from whom it was wrested by the Norman Crusaders between 1071 and 1090, soon afterwards becoming incorporated with Naples in the kingdom of the Two Sicilies. Several times was this union dissolved, and many changes of dynasty occurred, but the Garibaldian movement of 1860 enabled the Sicilians to throw off the Bourbon yoke—become intolerable under the despicable Bomba (Ferdinand II.), whose infamous treatment of political prisoners in loathsome Neapolitan cells, W. E. Gladstone publicly denounced in 1851—and join United Italy. The island is now divided into seven provinces—namely, Palermo, Messina, Catania, Syracuse, Caltanissetta, Girgenti, and Trapani, the Governor having his residence at Palermo. Pop. (1901), 3,529,799.

Sickingen, FRANZ VON, feudal baron, was born at Sickingen, Baden, Germany, on March 1st, 1481. As a leader of the Rhenish knights, he wielded great influence and enjoyed the friendship of the Emperor Maximilian I., who made him his chamberlain. He incurred the Imperial displeasure for disturbing the peace of Worms (1517) and afterwards waged war with the Duke of Lorraine, Metz, Philip of Hesse and other potentates. At the instigation of Ulrich von Hutten, he threw in his sympathies with the Reformation, many of whose leaders, including Martin Luther, Martin Bucer, Johann Reuchlin and Johannes Ecolampadius, he befriended. He supported the election of Charles V. to the Imperial throne and took part in the war against France in 1521. His attack on the Archbishop of Treves, however, in the following year, at the head of a mercenary army, created a strong counter-movement in support of the prelate. One stronghold after another was taken from him and, mortally wounded in the siege of Landstuhl, near Kaiserslautern, he died there on May 7th, 1523.

Sicyon, a city in the east of Achaia, ancient Greece, 2 miles S. of the Gulf of Corinth and about 10 miles N.W. of the city of Corinth. Under the strong rule of Tyrants it attained to great power in the 7th and 6th centuries B.C., but was of especial importance owing to its influence as an art centre. It was famous for its bronzes and pottery (particularly terra-cotta vases). Pamphilus and Apelles, the painters, and Lysippus, the sculptor, were natives, the two former studying at its art school. It was notable for its market and fruit gardens and for

its manufacture of shoes. In 251 B.C., under Aratus, one of its sons, it joined the Achæan League and, when Rome destroyed Corinth in 146 B.C., Sicyon gained in territory and strength and obtained the presidency of the Isthmian Games. As Corinth revived, however, it decayed and, by the 2nd Christian century, was almost uninhabited. Its site is now occupied by the village of Vasilika.

Siddons, SARAH, actress, was born at Brecon, Wales, on July 5th, 1755. Her father, Roger Kemble, was the respectable manager of an



MRS. SIDDONS. (By Thomas Gainsborough, R.A.)

itinerant theatrical company, and she received as good an education as it was possible to give to the child of strolling players who was obliged to travel with her parents. She appeared on the stage at a very early age, and in her nineteenth year became the wife of an actor named William Siddons, who belonged to her father's company. In 1775 she played "Portia" to Garrick's "Shylock" at Drury Lane without attracting much notice, but her subsequent successes at Birmingham, York, Bath, and elsewhere were so extraordinary that in 1782 she appeared a second time at Drury Lane, her rôle being now "Isabella" in *The Fatal Marriage*. Her success was immediate and complete, and from that time forward she was recognised as the leading actress of the day. In 1803 she joined her brother, John Philip Kemble, at Covent Garden, and played at that theatre till her retirement from the stage on June 29th, 1812. She died in London on June 8th, 1831. Of the numerous tragic parts especially associated with her name, "Lady Macbeth," "Queen Catharine," "Constance," "Isabella," and "Belvidera" are those in which she reigned supreme. She was the greatest actress in tragedy England has ever produced, but was not formed to shine in

comedy. She owed much to her physical gifts—a noble face, tall, graceful and commanding figure, and dignified carriage. Her private life was beyond reproach. Of numerous portraits those by Thomas Gainsborough in the London National Gallery and by Sir Joshua Reynolds (representing her as the Tragic Muse) in Dulwich Gallery and in Grosvenor House, London, are famous.

Sidereal Clock is a specially-regulated clock for measuring sidereal time. Accuracy is the great essential of observatory clocks, and so carefully are they now made that their variation seldom exceeds a second per day. Jewelling the holes has greatly diminished the errors due to friction, but careful compensation of the pendulum, so that its length is the same whatever be the temperature, has been the chief cause of the accuracy now attainable. Time measured in an observatory begins, not at noon as in an ordinary clock, but at the moment when the vernal point of intersection of ecliptic and equator—the first point of Aries—crosses the meridian, and from this point the hours go on till 24 o'clock. The time of the clock is constantly checked by means of the transits of certain stars. A number of such reference stars have had their right ascensions very accurately determined. Every day some of these are observed, and give the error of the clock. To find the right ascension of any celestial object, the time of its transit is noted, and its angular right ascension is got by converting the time into angles at the rate of 15° for each hour.

Sidgwick, HENRY, philosopher, son of the Rev. William Sidgwick, was born at Skipton, Yorkshire, on May 31st, 1838. Educated at Rugby and Cambridge, where he had a brilliant undergraduate career, "going out" as a wrangler and Senior Classic in 1859, he was elected Fellow of Trinity. After holding a classical lectureship for ten years, he exchanged it in 1869 for one in moral philosophy, to which he felt drawn, aiming at the foundation of a school of philosophy in the university. His views having undergone serious change, he felt constrained to resign his Fellowship. His action strengthened the agitation for the abolition of tests, a measure which was carried in 1871. Sidgwick was esteemed so highly he was permitted to retain his lectureship and until his death continued to lecture in different capacities. In 1874 his *Methods of Ethics* appeared (to which he subsequently added supplements in 1878 and 1884), a work which stimulated thought by its careful examination of ethical questions. He endeavoured to show that a rational basis of morality may be found which takes the general happiness for its standard. Appointed prælector on moral political philosophy in Trinity College in 1875, in 1883 he was elected Knightbridge professor of moral philosophy, and in 1885 his college re-elected him to a Fellowship. Interest in speculation did not debar him from engaging in practical matters, particularly in the question

of female education. Newnham College is a permanent memorial of the energy with which he championed the right of women to share in the advantages of university teaching. His private munificence often came to the aid of schemes which were in jeopardy. Newnham College was opened in 1876, in which year Sidgwick married Eleanor Mildred Balfour. When North Hall was added to Newnham the Sidgwicks went to reside there, Mrs. Sidgwick becoming vice-president under Miss Clough on whose death, in 1892, she became principal. From its foundation in 1882 until 1899 Sidgwick was a member of the General Board of Studies; an active member of a mendicity society in Cambridge; and, holding that some "direct proof of continued individual existence" was essential to morality, he became one of the founders of the Psychological Research Society and of the Metaphysical Society. In discussion his courtesy, humour, dialectical skill and freedom from self-assertion made him an invaluable link between exponents of opposing beliefs. In the early part of 1900 he learned that he was afflicted with an incurable disease. He resigned his professorship though feeling "full of vigour and vitality," and with splendid courage faced the inevitable, joining in social intercourse and maintaining his interest in the undertakings with which he was identified. He died at the house of his brother-in-law, Lord Rayleigh, on August 28th, 1900. His *Principles of Political Economy* appeared in 1883. His discussion, therein, of the proper functions of government has been pronounced "by far the best thing of the kind in any language." In 1885 *The Scope and Method of Economic Science* was published, followed, in 1886, by *Outlines of the History of Ethics* and, in 1891, by *The Elements of Politics*, an attempt to supply an adequate treatise starting from the lines of Bentham and Mill. He also contributed reviews on literary and philosophical subjects to various journals.

Sidi-Bel-Abbès, or BEL-ABBÈS, a town of Western Algeria, 40 miles S. of Oran, with which it is connected by rail. It was founded in 1843 by French colonists on a site abandoned by the Beni Amer tribe, who had retreated to Morocco. It is situated 1,550 feet above the sea and enjoys a healthy climate. Gardening and farming flourish, and a thriving trade is done in the export of fruit, vegetables and grain. Pop. (1901), 25,739.

Sidmouth, a watering-place, Devonshire, England, at the mouth of the Sid, 14 miles S.E. of Exeter. It was an important seaport in the reign of Edward III. and contributed two vessels to the siege of Calais, but the harbour silted up and its commerce decayed, though fishing boats and small vessels can still make the quay. It is picturesquely situated between Peake Hill and Salcombe Down and is especially adapted for invalids and sufferers from chest complaints. The west window of the church of St. Nicholas was presented by

Queen Victoria in 1866 in memory of her father, the Duke of Kent, who died here in 1820. The Duke and Duchess and the Princess Victoria then occupied Woolbrook Glen, a mansion at the west end of the town. The public buildings include the market, Volunteer hall, Masonic hall, baths and cottage hospital. Pop. (1901), 4,201.

Sidmouth, HENRY ADDINGTON, 1st Viscount, statesman, was the son of Dr. Anthony Addington, Lord Chatham's family physician, and was born at Reading on May 30th, 1757. He was educated at Cheam, Winchester and Brasenose College, Oxford. He studied for the bar, but, possibly on the advice of William Pitt, with whom he kept up almost a lifelong friendship, he took to politics, and in 1783 became member of Parliament for Devizes. From 1789 to 1801 he filled the Speaker's chair, when, on the solicitation of George III., who knew he shared his Majesty's narrow views about Catholic emancipation, he accepted office as Prime Minister. A pompous, dull man, of irreproachable character, his administration was feeble to a degree and he retired from office in 1804. In the following year he was created Viscount Sidmouth and in 1812 entered the Cabinet of Spencer Perceval as President of the Council and, after Perceval's assassination, became Home Secretary under Lord Liverpool. He was called to office at a grave crisis in the social affairs of his country. Luddite riots and general distress found him unprepared with any remedy but repression and force. He was seriously compromised by the Peterloo massacre at Manchester in 1819 and his share in the proceedings against Queen Caroline enhanced his unpopularity. He left office in 1821 and retired from the Cabinet in 1824, because he disapproved of the recognition of the independence of Buenos Aires. He died on February 15th, 1844, and was buried at Mortlake.

Sidney, ALGERNON, republican, son of Robert, 2nd Earl of Leicester, was probably born at Penshurst, near Tunbridge, Kent, in 1622, and was educated privately, accompanying his father to Denmark in 1632 and to Paris in 1636, and charming everyone with his wit and amiable disposition. After taking part in the suppression of the Irish rebellion (1642), he entered the Parliamentary army, and was badly wounded at Marston Moor. In 1647 he accompanied his brother, Lord Lisle, to Ireland as Lieutenant-General of the Horse, and in 1648 he was made Governor of Dover. He took no part in the trial and condemnation of Charles I., but he subsequently pronounced his execution a patriotic measure. After the dissolution of the Long Parliament (1653), he withdrew to Penshurst, and there wrote his *Discourses concerning Government*, a work advocating republican principles. He was engaged in diplomatic business at Stockholm when the Restoration occurred, and continued to reside on the Continent till 1677, when he

obtained permission to return. His negotiations with the French ambassador, Barillon, from whom he is said to have received money in 1680, have given rise to much conjecture. After the death of Shaftesbury (1682) he became one of the most active leaders of the Whig party. There is no evidence that he was implicated in the Rye House Plot; nevertheless, he was brought to trial, which was presided over by Jeffreys with more than his wonted brutality, condemned to death on the testimony of a single perjured witness, and beheaded on Tower Hill, London, on December 7th, 1683. His attainder was reversed in 1689.

Sidney, SIR PHILIP, soldier, statesman and poet, whose noble life and chivalrous death have justly made him the ideal of knightly heroism, was born at Penshurst, near Tun-



SIR PHILIP SIDNEY.

bridge, Kent, on November 30th, 1554. He was the son of Sir Henry Sidney (1529-1586), an able and upright Irish Viceroy, and Mary Dudley, daughter of John, Duke of Northumberland, and sister of Elizabeth's favourite, the Earl of Leicester. He received his education at Shrewsbury school and Christ Church, Oxford. In 1572 he set out on the grand tour, and was at Paris on the night of the Massacre of St. Bartholomew. At Frankfurt he made the acquaintance of his lifelong friend, the scholar Hubert Languet. After visiting Italy, he returned to England in 1575, and, aided by the patronage of his uncle Leicester, rapidly made his way at Court. In 1577 he went as ambassador to the Emperor Rudolph for the purpose of effecting a permanent union of the Protestant states—an impossible project, for the failure of which Sidney is not to be blamed. Having incurred Elizabeth's anger by a bold address, pointing out the evils which would result from a marriage with the Duke of Anjou, he withdrew from Court in 1580, and lived for a time with his sister, the Countess of Pembroke, at Wilton. In 1583 he married Frances, daughter of Sir Francis Walsingham, although for several years he had cherished an ardent affection for Penelope, Lady Rich. In 1585 he was about to set sail with Sir Francis Drake on an expedition against the Spaniards in America, when he received a message from the Queen forbidding him to leave England. He was, however, allowed to accompany Leicester, who was sent to the Netherlands to aid

the Dutch in their struggle with the Spaniards, and there, through a noble act of courage and self-sacrifice, he lost his life on the battlefield of Zutphen (September 22nd, 1586). Parched with thirst and carrying a fatal wound in his leg he called for drink, when he reached the English camp. A bottle of water was brought to him and he was about to partake when he caught sight of a dying soldier's eyes fixed hungrily on the vessel. Sir Philip at once passed him the bottle with the words, "Thy necessity is yet greater than mine," which along with the incident illustrate without further argument or rhetoric the whole duty of unselfishness. As a poet Sidney appears at his best in *Astrophel and Stella* (1591), a series of beautiful sonnets commemorating his hopeless passion for Penelope Devereux, sister of the Earl of Essex and wife of Lord Rich. His pastoral romance, *The Countess of Pembroke's Arcadia* (1590), occupies an important position in the development of English prose, and was very popular in its own day, but it is too prolix and artificial to please the present age. Another prose work, *The Defence of Poesie*—first called an *Apologie for Poetrie* (1595)—still keeps its place as a classic.

Sidon (modern SAIDA), an ancient Phœnician city which was situated on a plain on the coast of the Mediterranean, about 20 miles N. of Tyre. It was probably the earliest Phœnician settlement, and attained great commercial prosperity before the Jewish immigration, being subsequently eclipsed by its off-shoot Tyre. Cyrus and Alexander successively conquered it, and the Egyptians, Romans, and Turks became its masters. The existing village lies west of the ruins of the city, and belongs to the Pashalik of Acre. Pop., 11,000, mostly Mahomedans.

Sidonius Apollinaris, a Christian writer and bishop, was born at Lyons about A.D. 430. He married the daughter of the Emperor Avitus (456), and in 472 became Bishop of Clermont in Auvergne. His works, which possess considerable historical value, include nine books of letters and panegyrics in verse on three emperors. He died in 483.

Siebbegebirge (German, "the Seven Mountains"), a group of hills in Rhenish Prussia, Germany, on the right bank of the Rhine, forming part of the Westerwald, 8 miles S.E. of Bonn. The loftiest peak is the Ölberg (1,522 feet), but the most famous is the Drachenfels (1,066 feet). They are crowned with the ruins of baronial castles and afford a good building stone which was largely used in the construction of Cologne Cathedral.

Siedlce, a government of Russian Poland, bounded on the N. by Lomza, on the E. by Grodno and Volhynia, on the S. by Lublin, on the S.W. by Radom and on the N.W. by Warsaw. It occupies an area of 5,528 square miles. It is bordered on the east by the Bug and on the west by the Vistula. The surface is mostly level plain, but there is much marsh

land in the north and south-east and hilly ground towards the centre. Rye, wheat, oats, and barley are the grain crops, and potatoes are very extensively cultivated and live-stock is raised on a large scale. Brewing and distilling are the chief industries. Siedlce (23,714) is the capital. Pop., 775,326.

Siege ("a sitting down before") is the name given to a particular mode of attacking a fortified town which cannot be taken by surprise or by direct assault. The siege differs from a blockade in that the latter consists in simply preventing ingress to or egress from a place; though sometimes the two are combined, as in the case of the siege of Antwerp in the 16th century. The first thing necessary in establishing a siege is to overpower any outlying forts that might harass the attacking party. Batteries are then established within easy cannon-range, and the attack is opened. Meanwhile a gradual advance is made upon the stronghold by means of trenches, which are protected at intervals by parallels, and which are carried on by zig-zags, so as to avoid being swept by the enemy's fire. In the case of a moat, mining is employed if possible. Provision is made in the trenches and parallels for accommodating a sufficient number of troops to repel any sortie attempted by the besieged garrison. When a breach is made in the walls by mining or direct battery, the assault is delivered. There were memorable sieges in the Peninsular War; and in later times those of Sebastopol, in the Crimean War, of Paris, in the Franco-German War, of Plevna, in the Russo-Turkish War, and of Port Arthur, in the Russo-Japanese War, were of much importance and historically interesting.

Siegen, a town of Westphalia, Prussia, about 50 miles E. of Cologne, on the Sieg, a right-hand affluent of the Rhine, into which it falls opposite Bonn. Iron-founding, iron-smelting, tanning, paper-making, and the making of machinery are the leading industries. Originally Siegen was the capital of a principality belonging to Nassau, the junior branch of which deriving from it (1606) its title of Nassau-Siegen. In 1815 it was assigned to Prussia by the Congress of Vienna. It claims to have been the birthplace of Peter Paul Rubens, the famous painter, in 1577. Pop. (1900), 22,110.

Siemens, SIR WILLIAM (KARL WILHELM), metallurgist and electrician, was born at Leuthe, in Hanover, Germany, on April 4th, 1823, and received his education at the Polytechnic school of Magdeburg and the university of Göttingen. In 1843 he came to England in order to patent a process for electro-gilding, invented by his elder brother, ERNST WERNER VON SIEMENS (born at Leuthe on December 13th, 1816; died at Berlin on December 6th, 1892), and himself. A second journey to England in 1844, in which he brought with him his "chronometric" or differential governor, was followed by his permanent settlement in

the country, Wilhelm conducting the affairs of "Siemens Brothers" in England, whilst Werner, also an able electrician, for the most part resided in Prussia. Wilhelm's genius received ample recognition, and in 1882 he was President of the British Association. He was knighted in 1883 and died at London in the same year on November 19th. Among his more important inventions were the regenerative furnace, the selenium eye, and various electric railways. He also devised the steamer *Faraday* for laying the Direct United States Cable in 1874.

Siena, or SIENNA, a province of Italy, and its capital. The former has an area of 1,471 square miles in the centre of Tuscany, the northern portion being mountainous, but yielding fine marbles, whilst the plains and valleys are fertile. In 1905 its population was estimated at 240,281. The city, picturesquely built on three steep hills at an elevation of 1,000 feet above the sea, was in the Middle Ages a strong and wealthy place, the centre of a republic which rivalled Florence and Pisa. Its cathedral (11th to 13th century) is the noblest existing specimen of Italian Gothic, and contains many beautiful works of art, including the magnificent pulpit designed by Niccolò Pisano (1274). The cathedral library, founded by Cardinal Francesco Piccolomini-Todeschini (afterwards Pius III.), contains Pinturicchio's famous frescoes. The university founded in the 14th century still flourishes, though restricted to the faculties of law and medicine. Other public structures are the city library, the Institute of Fine Arts, the Palazzo del Governo containing the Sienese archives, the communal palace, one hall of which was decorated by native artists in memory of King Victor Emmanuel and opened in 1891, the Buonsignori Palace and the Opera del Duomo with numerous examples of art. The narrow winding streets are charmingly picturesque, and the many churches, such as San Giovanni, San Francesco and San Domenico, are full of treasures, either architectural or pictorial. There are manufactures of textiles and hats. Pop. (1901), 28,355.

Sienkiewicz, HENRYK, novelist, was born at Okreya, Radom, Russian Poland, on May 4th, 1846, and was educated at the Gymnasium and University of Warsaw. In 1869 he was editor of a Warsaw journal called *Slowo* and in the following year published his first novel, *In Vain*. In 1872 appeared his *Save in his own Country*, and in 1873 *Hania* and other stories, the realism and sentiment of which had begun to captivate the public. Travels in Germany, France, the British Isles and the United States occupied the years from 1876 to 1878, and among the stories published after his return was *Bartek*, in which he utilised some episodes of the Franco-German War. In 1884 he struck the vein of historical romance that brought him into universal recognition. *Fire and Sword* (1884), *The Deluge* (1886), and *Pan*

Michael (1888) were a trilogy dealing with Polish subjects. In 1890 he published *Without Dogma*, a study of Slav psychology, and in 1891 he travelled from Egypt to Zanzibar and also visited the Carpathians, Venice and Rome. In 1895 appeared his masterpiece *Quo Vadis*, a Christian romance of the days of Nero, which has been translated into most of the languages of the globe. Since that brilliant success he has written other novels, of which *Soldiers of the Cross* (1900) is perhaps the best. In a little book published in 1901, *Sea Story*, he reviewed the significance of his work as the national novelist of Poland.

Sierra Leone, a Crown colony belonging to Great Britain, situated on the west coast of Africa between Rivières du Sud (French Guinea) on the north-west and Liberia on the south-east. The river Scarcies divides it from the French possessions. Sierra Leone proper consists of a peninsula about 26 miles long by 12 miles broad, terminating in Cape Sierra Leone, but the colony has a coast-line of 180 miles, extends inland to distances varying from 8 to 20 miles, includes the Yellaboi islands off the north coast and Sherbro off the south and has an area of about 4,000 square miles. Beyond this there is a Protectorate running as far inland as the Futa Jallon region and having an area of 30,000 square miles and a population of 1,000,000. Some of the lofty ground in the hinterland reaches a height of nearly 3,000 feet and the colony is well watered. The climate is distinctly unhealthy (they call it "the white man's grave") and the average annual rainfall is 170 inches, though it may exceed 200 inches. The fertile soil yields rice, maize, yams, plantains, pumpkins, cassava, sugar, coffee, indigo, ginger and cotton. Amongst the fruits are cocoanut, banana, pine-apple, orange, lime, guava, papaw and pomegranate. Gold and silver are mined. The chief exports comprise palm oil and kernels, ginger, ground nuts, kola nuts, indiarubber and cotton. The colony was established in 1787 and colonised by liberated negroes. Freetown (34,463), the capital, is the greatest seaport in West Africa and has a supreme court, Furah Bay College (a training college for teachers, affiliated to the University of Durham) and a botanical garden. It is one of the few places on the earth's surface where the white man is held cheap because he is white. The Freetown darkey's choicest phrase is, "White niggahs and black genelmen." Pop. of colony (1901), 76,655.

Sierra Nevada ("Snowy Range"), the name given to the most southerly and most elevated of the parallel systems that cross Spain from east to west. It traverses the whole of Granada from Alhama to Baza, a distance of over 100 miles, and contains the peaks of Mulhacen (11,678), and Veleta (11,378), the snow-line being drawn at about 9,500 feet. In geological formation the range resembles the Pyrenees, and is rich in iron, copper, silver-lead, zinc, and

antimony. Olives, chestnuts, and oranges abound.

Sierra Nevada, a great mountain chain of North America, which runs parallel to the Rocky Mountains between California and Utah, and forms the western boundary of the state of Nevada. The range, which is the veritable buttress of California, extends from 37° to 42° N., being the watershed of the Sacramento, the San Joaquin, and other Californian rivers. The best-known peak is Mount Shasta (14,000 feet), but there are many others of superb contour, amongst them Mount Whitney (14,898), Fisherman (14,448), Corcoran (14,093), Brower (13,886), Lyell (13,042), and Dana (13,225). Its valleys, which include the famous Yosemite, are bounded by walls of rock several thousands of feet high and present features of extraordinary grandeur and beauty. One of its forest marvels is the *Sequoia gigantea*. In formation the range is volcanic, and it possesses great mineral resources, silver being especially abundant.

Siegès, EMMANUEL JOSEPH, commonly known as the Abbé Siegès, the most intellectual of the politicians who took part in the French Revolution, was the son of the director of the post-office at Fréjus, in the department of Var, where he was born on May 3rd, 1748. After receiving his early education from the Jesuits of his native town, he studied philosophy and theology at St. Sulpice, in Paris, and was appointed vicar-general by the Bishop of Chartres. In response to Necker's invitation to French writers to make known their views concerning the manner of assembling the States-General, he published several political pamphlets, including the famous *Qu'est-ce que le Tiers-Etat?* ("What is the Third Estate?"), which undoubtedly hastened on the Revolution. When the States-General met in 1789, he appeared as deputy for the city of Paris. It was he who suggested that the three estates should form a single assembly, and proposed the name "National Assembly," which was adopted by the unified body. He was but a poor speaker, but he maintained his position as an abstract politician and a framer of constitutions, winning new laurels by his published speech opposing the royal veto. In the Legislative Assembly he sat in the Centre, but he had not the courage to defend the Girondists, and sank into comparative obscurity, only coming forward at the installation of the Goddess of Reason to renounce his faith in the Christian religion. In 1795 he was one of a commission appointed to frame a new constitution, but his proposals were rejected. In 1798 he was sent as ambassador to Berlin, and began to intrigue with Napoleon. The *coup d'état* of 18 Brumaire (November 9th, 1799) was followed by the establishment of the Third Consulate, composed of Napoleon, Siegès and Ducos, but Siegès was outwitted by his great colleague, and was glad to retire to an estate at Crosne with the title of count and a handsome pension. After the second return of the Bourbons he fled to Bel-

gium, but in 1830 he returned to Paris, where he died on June 30th, 1836.

Sigillaria, a genus of fossil club-mosses, belonging probably to the order Selaginellales, which formed one of the chief types of the vegetation of the Coal Measures. They had large and lofty stems, either unbranched or dichotomous, covered with the scars of fallen leaves in vertical rows. The leaves were narrow, linear and sedge-like, reaching eighteen inches in length; but generally only the cushion of attachment is preserved. The roots, known as *Stigmaries*, are found in the fire-clay below coal-seams, and in the Devonian. They reach twenty or thirty feet in length, and are cylindric and dichotomous. Their outer surface is pitted with the scars of the rootlets, and they have a medulla and a vascular cylinder of scalariform tracheids, growth being apical. The cone of fructification, known as *Sigillariostrobus*, is rare. It resembles *Lepidostrobus*, that of *Lepidodendron*, and was probably heterosporous.

Sigismund, the younger son of Charles IV., German-emperor, was born on February 14th, 1362, and succeeded his father as Margrave of Brandenburg in 1378. Having married Maria, daughter of Ludwig of Hungary, he was elected to fill that throne. In 1410, on the death of Ruprecht, Palatine of the Rhine, he was put forward by a strong party as candidate for the imperial dignity, and after some disputes received the unanimous vote of the Diet, being crowned in 1414. Under his auspices the Council of Constance was held in the same year, and his reign was one continual struggle with the Hussites, whose leader he treacherously burned in 1415. His later years were passed in wars against the Turks, from whom he took Belgrade. With him the Luxemburg dynasty ended, as at his death at Znaim in Moravia, on December 9th, 1437, he left only a daughter. By the sale of Brandenburg to the burgrave of Nuremberg he laid the foundation of the Prussian kingdom. This was the emperor of whom Thomas Carlyle wrote in his *Frederick the Great* (Book II., chap. 14)—“I call him in my Note-books Sigismund *Super Grammaticam*, to distinguish him in the imbrolio of Kaisers.” The historian alludes to the lofty, not to say supercilious attitude of the emperor at the Diet of Constance. A Cardinal mildly ventured to tell him that the word *schisma* was neuter and not feminine as the Kaiser had supposed. Sigismund's answer was superb—“Ego sum Rex Romanus et super Grammaticam” (“I am King of the Romans, and above grammar”).

Signalling, the means of conveying from a distance information to the eye or ear of intelligence that cannot otherwise readily be made known. Among the contrivances made use of are flags, boards, lights, guns, bells, steam-whistles, etc. In the navy signalling is especially required, and has also been largely adopted

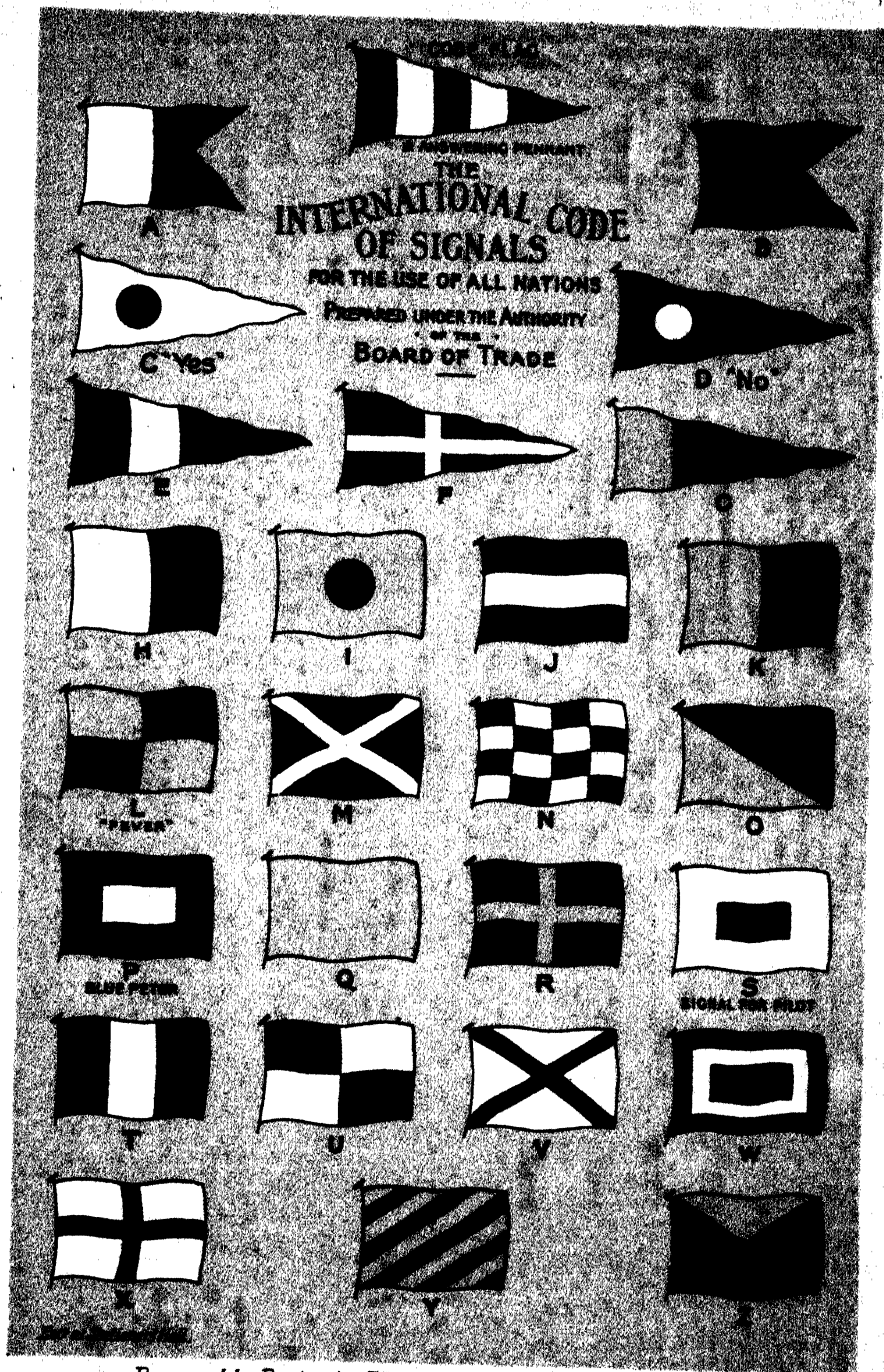
in military operations. Signalling at sea was much simplified by the introduction, by Captain Frederick Marryat (1792-1848), the novelist (whose adaptation gained him in 1819 the Fellowship of the Royal Society), and later experimentalists, of a system of codification, whereby a limited set of signals was made to do duty for some fourteen thousand words and phrases. A new international code of signals was introduced in 1901. The international code of signals, which was first known as the Commercial Code, was prepared and published in April, 1857. Another committee was appointed by the British Board of Trade in 1887 to bring it up to date. That committee made its final report in 1897, and it was proposed to introduce the new code on the first day of 1899. However, the time occupied in the necessary negotiations with foreign Powers was greater than anticipated, and so a further delay took place. The advantages of the new code over the old one may best be brought home to the lay mind by a statement of the number of signals possible under both:—

| | Old. | New. |
|---------------------|--------|---------|
| One flag signals .. | 4 | 26 |
| Two flag signals... | 215 | 659 |
| Three flag signals | 4,500 | 15,600 |
| Four flag signals | 29,600 | 328,800 |
| | 34,319 | 345,076 |

The new code provides a flag for every letter of the alphabet. Moreover, the abolition of all four-flag hoists for general signals very greatly increases the rapidity with which communication can be held. The two codes were used concurrently for a year, but after the first day of 1902 only the new one was recognised. Of course the Board of Trade has no statutory power to compel shipowners to employ it, but there is a general agreement among the chief maritime Powers to adopt it, and that is an overwhelming force in matters of this kind. Railway signalling is accomplished principally by the use of semaphores, coloured lights, and detonators, and occasionally by means of flags.

Signature, a natural marking upon a plant, formerly supposed to be indicative of some special use. It was a quack theory that could only prevail in a backward condition of knowledge. The doctrine of signatures, as it was magniloquently styled, applied to minerals and other substances as well as plants. It affected to trace some relationship between colour and disease—as, for instance, between yellow flowers and jaundice and bloodstones and bleeding—and also found hidden significance in shape, as in the mandrake, and other physical features. The doctrine left its mark in the nomenclature of certain plants and grasses, such as scorpion-grass, serpent-grass, which were ignorantly believed to possess mysterious prophylactic or curative qualities.

Signorelli, LUCA, or LUCA DA CORTONA, painter, was born at Cortona in Tuscany, Italy, in 1441, and becoming the chief of the Tuscan



Prepared by Benjamin Edgington for "Cassell's Encyclopædia"

school of painting, was invited to Rome in 1478, where he painted one of the frescoes in the Sistine Chapel. His best work, however, is to be seen in the cathedral of Orvieto, "The Last Judgment" having supplied Michael Angelo with suggestions for his own great picture. Whether this were so or not, there is little doubt but that Michael Angelo recognised the enormous energy and uncompromising drawing of his forerunner. Signorelli seemed to sacrifice everything—colour, beauty, charm—to absolute truth. He returned to Cortona in 1502, on the completion of these grand frescoes, but was summoned to Rome in 1508 to undertake, along with other painters, the decoration of the Vatican for Pope Julius II. But a still greater man had now come on the scene and Signorelli and the rest retired to make way for Raphael. Several of his altar-pieces exist at Cortona, and other pictures in oils are preserved in Continental galleries, but genuine specimens are rare. He died in Cortona about 1525.

Sigourney, LYDIA HUNTLEY, author, was born at Norwich, Connecticut, United States, on September 1st, 1791, her father being Ezekiel Huntley, a soldier of the Revolutionary period. She began life as a teacher, but the success of her first book, *Moral Pieces in Prose and Verse* (1815), gave her a definite bent towards literature, which her marriage (1819) with Charles Sigourney, a merchant of literary and artistic tastes, enabled her to satisfy. She then took up her home in Hartford, Connecticut, which she never left save during 1840, when she made the European tour recorded in *Pleasant Memories of Pleasant Lands* (1842), and where she died on June 10th, 1865. She was always practically interested in benevolence and made the welfare and happiness of the poor and needy, the deaf and dumb and blind, and the slave her constant care. Her literary activity, too, was immense. She wrote 46 separate books and more than 2,000 articles. If not of a high order, her poetry was graceful and sometimes felicitously phrased and her prose elegant. Her most popular works were *Sketch of Connecticut Forty Years Since* (1824), *Letters to Young Ladies* (1833), *Letters to Mothers* (1838), *Pocahontas, and other Poems* (1841), *Voices of Flowers* (1845), *Olive Leaves* (1851), and *The Man of Uz, and other Poems*, (1862).

Sihon is traditionally represented to have been King of the Amorites and his territory was bounded on the N. by the Jabbok, on the E. by the desert, on the S. by the Arnon flowing into the Dead Sea, and on the W. by the Jordan. The Israelites, having been refused permission to pass through his country to reach Jordan and invade Canaan, settled the difficulty by attacking Sihon at Jahaz, defeating his army and slaying him. They then captured Heshbon, his capital, and annexed his dominion, and thus, without meaning it, became masters of Gilead. There seems reason to believe, however, that the traditional account is at fault in several

particulars, and that probably Sihon was a miswriting for Cush in North Arabia.

Sikhs, i.e., "Disciples," members of a peculiar sect, which was founded in the Punjab by Nanak in the 15th century, and which may be described as a monotheistic reformation of Brahminism developed under Moslem influences. Its tenets are embodied in the Granth or Sacred Books, which are accepted both by the Khalsa or Old Sikhs and the Singhs ("Lions"), as the reformed Sikhs call themselves. The term has acquired a certain ethnical significance from the fact that all the Sikhs belong to the Jat race, and are distinguished by their fine development, courage, and loyalty.

Sikkim, a feudatory state in the Himalaya, India, bounded on the N. by Tibet, on the E. by the Tibetan district of Chumbi, on the S. by the British district of Darjiling, and on the W. by Nepal. From north to south it measures 70 miles, from east to west 50 miles and covers an area of 2,818 square miles. By a treaty between Great Britain and China, ratified on August 17th, 1890, a British protectorate over Sikkim was recognised and exclusive control over the foreign affairs and internal administration was vested in the British Government. The Maharaja proving recalcitrant, he was invited to reside in India for a period and returned to Sikkim in 1895. The inhabitants of the state call themselves Rong, but to the Ghurkhas of Nepal they are known as Lepchas, and their religion is the Lamaism of Tibet. The surface of the country is entirely mountainous, but the valleys yield crops of rice, maize, millet, tea, cotton, oranges and other fruits. Copper is mined and the forests are of great value. The jungle is infested with leeches, which are not only a nuisance to human beings, but a positive pest to the horses and goats. The chief towns are Tumlong and Gamtak. Pop. (1901), 59,014.

Silage, a method of preparing green fodder for cattle and horses by storing it under pressure in silos, or pits, or in stacks above the ground, water being excluded carefully. Ensilage, as the process is called, is of great antiquity, but the practice of converting green fodder into sour hay was revived in Germany in 1843 and became established in the United States about 1880 and in the United Kingdom in 1893. The silo was an underground chamber, airtight and watertight, in which the fodder was closely packed and then covered over and submitted to very heavy mechanical pressure. It was thus exposed to fermentation which, if not allowed to go too far, was found to be beneficial, the fodder thus treated being in a condition analogous to that of sauerkraut, which is produced by the fermentation of cabbage. The construction of silos was always a matter of expense and the practice might not have become general, but for the discovery in 1887 that silage might be made in stacks, the convenience and cheapness of which rendered this method popular.

Stock partake of sweet and sour silage with apparently equal relish. Sweet silage is prepared by postponing the pressure for two or three days until the temperature of the material has reached 130° to 140° F., a temperature high enough to kill the bacteria which produce the acid fermentation, and then applying pressure and covering the top of the silo. Sour silage is obtained by applying the pressure immediately the silo is filled with fodder. Grasses, clover, cereals and most kinds of green stuff excepting roots lend themselves to treatment by ensilage.

Silbury Hill. [AVEBURY.]

Silchester, a village of Hampshire, England, 7 miles N. of Basingstoke. It was the site of



EXCAVATED REMAINS OF EARLY BRITISH CHURCH, SILCHESTER.

(Photo: S. V. White, Reading.)

the Roman town of Calleva Atrebatum, the ground plan of which, thanks to the unremitting labours of private archæologists and the Society of Antiquaries, has been, to a surprising extent, disclosed by excavation and research. Near the middle of the town was the forum, adjoining which stood a Christian church (the earliest in England), while farther off were two square temples, a round temple and a building which is conjectured to have been an inn, furnished with baths. Remains of some "self-contained" houses, each standing in its own garden, of shops (including a bakery, dyehouse, and a silver refinery) as well as of the streets, which intersected each other at right angles, have been made out. Pottery, coins, ornaments, tools, and such smaller articles have been discovered in large numbers, though few if any examples of outstanding merit have come to light. Many of the relics have been deposited in the museum at Reading. The village is thus one of the most interesting places in England. Pop. (1901), 390.

Silenus, in classical mythology, was a demigod, the son of Hermes or Pan and a nymph. The youthful Bacchus was committed to his

charge. He accompanied him to India, and is generally depicted as a fat and drunken old man riding on an ass, and surrounded by a riotous crew of fauns and bacchantes. He received most veneration in Elis and Arcadia.

Silesia, AUSTRIAN, a province of Austria, bounded on the N. by Prussian Silesia, on the E. by Galicia, on the S. by Hungary, and on the W. by Moravia. It covers an area of 1,987 square miles. The surface is mountainous in the west, where outliers of the Sudetic mountains occur, and in the south, where the Carpathians border the country, which is watered by the Vistula and Oder and certain tributaries. Dairying and the raising of live-stock are carried on in the upland districts, while textiles, iron and steel industries and coal-mining flourish. The province sends 12 members to the Reichsrat. Troppau (26,748) is the capital. Pop. (1900), 680,422, of whom fully half are Slavs (Poles, Czechs and Slovaks) and the rest Germans.

Silesia (German, *Schlesien*), a province of Prussia, bounded on the N. by Posen, on the E. by Russian Poland, on the S.E. by Galicia, on the S. by Austrian Silesia, Moravia and Bohemia, on the S.W. by Saxony, and on the N.W. by Brandenburg. It occupies an area of 15,568 square miles. From the 10th to the 12th century this tract was under Polish government, and from the 12th to the 14th century it was divided into two duchies, Upper and Lower Silesia. After the 14th century it became broken up into a number of petty states: Schweidnitz, Glogau, Oels, Jägerndorf, etc., over most of which Bohemia exercised suzerainty. In 1537 the Duke of Liegnitz left his dominions to Brandenburg, and thus gave rise to the struggle between Austria and Prussia for the possession of this territory, which was only brought to an end with the Seven Years' War. Prussia then got the greater share (15,568 square miles), and Austria 1,987 square miles. The capital of the Prussian province, which embraces some of the richest and of the most picturesque land in Germany, is Breslau (422,709). In the south the surface is mountainous, where the Riesengebirge, whose highest point is the Schneekoppe (5,265 feet), a portion of the Sudetic system, are the chief physical features. The province is drained by the Oder and its tributaries. Cereals, potatoes and beet-root are the principal crops and live-stock (especially cattle, pigs and horses) are raised in great numbers. The mineral wealth is of first-rate importance and includes coal, iron, zinc, lead and silver. The industries are amongst the foremost in Germany and comprise iron smelting and founding, flax-spinning, linen-weaving, sugar-refining, brewing and distilling, besides manufactures of glass, porcelain, earthenware, chemicals, paper, leather, textiles

and tobacco. Pop. (1900), 4,668,857, of whom three-fourths are German, the rest being mainly Poles.

Silhouette, a profile portrait which is filled in in black upon a white ground. It derives its name from Étienne de Silhouette (born at Limoges in 1709; died at Brie-sur-Marne in 1767), who was French Finance Minister in 1759, according to some, because he delighted in making these portraits. Silhouettes can be cut from black paper and pasted on a white ground, or can be traced from shadows on the wall. They may be enlarged or reduced by an instrument called the pantograph.

Silica consists of the oxide of silicon represented by the formula SiO_2 . It is very plentiful upon the crust of the earth, both in a free state and combined with other oxides, and is by far the most abundant oxide. It also occurs in many grasses and bamboos, as well as in birds' feathers. In minerals it occurs free:—crystalline, as quartz and tridymite, and in a non-crystalline form as the opal. Flint is also a form of silica, while the agate and chalcedony are mixtures of the amorphous and crystalline varieties. Sand and sandstone, quartzite and some other rocks consist chiefly of silica. In combinations it acts the part of an acid, uniting with other oxides to form silicates, and, according to the quantity of silica present, rocks are known as acid, intermediate, or basic. It may be prepared artificially as a white powder, insoluble in acids, except hydrofluoric, possessing a specific gravity of 2.2. It is very infusible, but may be melted in the oxyhydrogen flame. Many hot springs and geysers contain silica, as it is soluble in alkaline hot solutions. The compound is precipitated from the water as it cools and evaporates, and by this means great deposits of silica may be found, as in the "sinter" terraces in Yellowstone Park and other localities.

Silicates are compounds which may be regarded as derived from silicic acids by replacement of the hydrogen by metals. Owing to the complicated nature of most of the silicates, however, they are more usually written as compounds of silica and other oxides, the real nature of the compound being unknown. They are almost all insoluble, the alkaline silicates being the only exceptions. Sodium silicate (NaSiO_3) is known as soluble glass, and its solution is employed for rendering wood, etc., fireproof. Many rocks consist almost entirely of silicates, as do most of the minerals which form the earth's crust. Glass also consists entirely of silicates; thus flint-glass consists of alkaline and lead silicates, other glass of silicates of calcium, sodium, potassium, etc.

Silicic Acids, acids from which the silicates may be regarded as derived, but which cannot be regarded as always existing free.

Silicon (chemical symbol, Si; atomic weight, 28) is a non-metallic element which was first prepared by Berzelius in 1810. It is only prepared

with difficulty, although its compounds are very numerous. Next to oxygen it is the most abundant element in the earth's crust, occurring, however, always in the combined state as silica or silicates. It may be obtained as a brown powder which burns if heated, forming the oxide silica. It may also be obtained in a crystalline form as black hexagonal tablets, somewhat resembling graphite, and also as octahedral crystals. It unites with hydrogen to form a gaseous hydride, and forms interesting chlorides, bromides, and iodides. In its chemical deportment it exhibits many striking similarities to carbon. Many organic compounds containing carbon thus are represented amongst silicon compounds, the only constitutional difference being the replacement of carbon by silicon. Thus, silico chloroform (SiHCl_3) corresponds to chloroform (CHCl_3), etc. Its oxide is known as silica, and forms the basis of a large number of compounds known as silicates.

Siliquea (Latin, "husk"; "pod"), a dry syncarpous superior fruit, typically made up of two carpels and two-chambered, though having parietal placentation. It has a replum, or persistent septum, formed by outgrowth from the placentas, and valvular dehiscence, the two carpels separating from below, leaving the seeds attached to the replum. The siliquea is generally flattened, either parallel with the (broad) replum, when the fruit is termed latisept, or at right angles to the (narrow) replum, when it is called angustisept. The typical siliquea is elongated and pod-like, as in the cabbages, mustards, wallflowers, etc. When shorter than its breadth, it is called a silicle (silicula), as in the shepherd's purse, the two varieties forming the typical fruits of the order Cruciferae. Exceptionally (*Tetrapoma*) there are four carpels; or the siliquea is transversely constricted between the seeds, as in radishes. It is then termed lomentaceous. A fruit much resembling a siliquea occurs in *Chelidonium* and *Glaucium*, belonging to the allied order Papaveraceae.

Silistria (Turkish, *Dristria*), a fortified town in Bulgaria, on the right bank of the Danube, 57 miles N. by E. of Shumla. The Durostorum of the Romans, it was a prominent town of the province of *Moesia Inferior*, and a place of some importance under the Byzantine emperors. Turkish rule began towards the end of the 14th century, and it continued to be the most prosperous town on the Lower Danube. The Russians captured it in 1810, and before they retired demolished the fortifications, which were, however, restored, and, in 1828-9, enabled the townsfolk to offer strenuous resistance to the Russians, who were repelled in 1854. Invested in the Russo-Turkish War of 1877-8, it was surrendered by the Turks on the termination of hostilities. The industries include tanning, weaving, and milling. Tobacco is cultivated, and there are large vineyards in the vicinity. Pop. (1900), 12,133.

Silius Italicus, Latin epic poet, was born in A.D. 25, but his birthplace is unknown. He

began his career as a politician and orator, and must have been a man of undoubted administrative capacity, for he was consul in 69, the year of Nero's death, and proconsul of Asia at a later date. The younger Pliny gives him a high character, and it is known that he was a student of literature and art, an enthusiastic collector, and a worshipper at the shrine of Cicero and Virgil. He owned the former's estate at Tusculum, and the latter's at Naples, and much of his later life was spent in meditation by Virgil's tomb. Finding himself smitten with incurable disease, he starved himself to death in 101. His epic poem, *Punica*, deals with the second Carthaginian war in smooth and correct lines that never rise into grandeur nor sink into bathos, though it is abundantly clear that the subject was far beyond his powers of imagination, invention and execution.

Silk (Anglo-Saxon, *seolc*), a fibrous substance prepared from the cocoon of the silkworm, and used as the material of costly stuffs and garments. The name was derived through Latin, *sericum*, Greek, *serikon*, from *ser*, the Greek name of the silkworm, borrowed from the Chinese *se* or *si* (in Korean *sir*). Seres, the name of the Chinese themselves, had the same origin.

The Silkworm. The silkworm is the larva or caterpillar of various moths belonging to the Bombycidae, Saturniidae and other families of the order Lepidoptera. The most important is the *Bombyx mori*, a moth about an inch long (or in the case of the females somewhat larger),



SILKWORM, SHOWING MOTH, WORM, COCOON, AND CHRYSLIS.

FEMALE MOTH AND EGGS.

with dark wavy lines on its yellowish-white wings. It takes its name from the morus or mulberry-tree, the leaves of which form its principal food. The female lives but a short time after depositing her eggs on the leaves of the mulberry, and the males have also an ephemeral existence. The caterpillar, on emerging from the egg, is about $\frac{1}{4}$ inch long, but before entering on the chrysalis stage at the end of six or eight weeks it attains the length of 3 inches. It is a hairless yellowish-grey insect, with a peculiar horn-like protuberance near its tail. During the larva stage it casts its skin four times. When the time for spinning approaches, it ceases to take any food. The gummy substance from which the silk is

produced is secreted in two long glands which run along each side of the body, and end in a single opening on the lower lip, called the "spinneret" or "seripositor." Under the microscope the bave or thread of the cocoon is seen to consist of two filaments (brins) ejected from the two glands, which are supposed to adhere together in consequence of their own glutinous properties. The cocoon is of a white or golden-yellow colour, and about as large as a pigeon's egg. The spinning occupies about five days, and is followed by a period of pupa life lasting some two or three weeks. The *Bombyx mori* produces but one generation annually; in other cases two or more are produced, but the silk is then inferior.

Cultivation of the Silkworm. Success in sericulture depends in great measure on the leaves on which the worms are fed. It is important that the quality should be good and the supply abundant—conditions which are best secured in a high situation and on a dry soil. In Europe the *Morus alba* is generally preferred to other varieties. The eggs are now hatched by stove-heat, the temperature being gradually increased from 64° to 82° F. through a period of eight or ten days. Pieces of paper with small perforations are laid over the trays in which the hatching takes place, in order that the caterpillars may creep through the holes and thus rid themselves of portions of shell which might cause their death through constriction. It is important that the rearing-house should be roomy and well ventilated, and that overcrowding should be prevented, so as to allow each worm its due share of food and, at a later stage, sufficient space in which to spin its cocoon. This is done in branches of brushwood or bundles of twigs placed for the purpose above the shelves or trays. If the silk is to be reeled, the moth must not be allowed to form within the shell and burst through the cocoon. The pupa is therefore killed by placing the cocoon in hot water, or more usually in an oven heated by steam. The cocoons selected for breeding are laid on a cloth in a darkened room, the temperature of which ranges from 66° to 72° F. The sorter must be able to tell from the appearance of the cocoon whether the pupa is dead, and, if it lives, whether it will become a male or female moth, the sexes being distinguished by their difference in shape and size. Silkworms are liable to various diseases, the most important of which are pebrine and muscardine.

The Manufacture of Silk. Silk is either reeled or spun, the latter treatment being adopted only in the case of waste silk—i.e., damaged cocoons, the floss and husks of reeled cocoons, and the pieces of thread broken off in the processes of reeling and throwing, together with certain wild silks. Waste silk is spun into yarn in much the same manner as other fibres. The first step in the preparation of the better kind of silk is to place the cocoons in shallow basins of warm water, so as to soften the gum which holds the filaments together. The floss having been removed by means of a small brush

made of twigs, the main filaments are caught, and, as they are unwound from their several cocoons, three or five are brought together so as to form a single strand, which is passed through an eyelet in the reeling machine. Care must be taken to preserve the thickness of the strand by supplying thread from a fresh cocoon when one of the former threads breaks or becomes exhausted. The silk thus produced, called "raw silk," is made up into hanks. After the raw silk has been washed, it is subjected to a series of operations called "throwing," the purpose of which is to form it into stronger yarn. The hanks are first fixed on reels called "swifts," resembling those used in the former process, and as the swifts move the silk is wound on bobbins. The cleaning which follows is effected by passing the filament through a slit called the "cleaner," the silk being meanwhile reeled from one bobbin to another. This slit is the gauge of the thread, and presents an obstacle whenever there is any irregularity or coating of dirt. The silk is then passed over a smooth rod of metal or glass, and through a second guide to the bobbin on which it is wound. After this the thread is twisted so as to make it ready for doubling—i.e., removing the silk from several bobbins on to a single large bobbin, which is placed in the throwing machine. It is there wound by a reel into hanks, which are subsequently wound on reels and bobbins for the weaver. Raw silk may be either: (1) "singles," consisting of one strand of twisted silk composed of the filaments of eight to ten cocoons; or (2) "tram," in which two or three strands are combined without being twisted before doubling; or (3) "organzine," composed of two or sometimes three twisted strands which have been spun in the opposite direction to that in which each was twisted.

History of the Industry. For many centuries sericulture and the manufacture of silken goods were confined to China. According to a Chinese work entitled *The Silkworm Classic*, Se-ling-she, wife of the Emperor Hwang-te, herself reared silkworms and caused the mulberry-tree to be grown and silk to be reeled as far back as 2640 B.C. The industry made its way through Korea to Japan at the beginning of the 3rd century of the Christian era, and a little later it became known in India, whence it spread to Persia and the regions of Central Asia. In the early days of the Roman Empire raw silk and silken goods were imported extensively from the East, but the worm was not reared nor looms set up before the time of Justinian. Subsequently the silk trade fell into the hands of the Arabs, who introduced it into all their settlements from Asia Minor to Sicily. After the fall of that people it continued to flourish in Apulia, and was also planted in Florence, Venice, Genoa, and Milan, which maintained their celebrity as silk-producing towns throughout the Middle Ages. Silk-weaving and the rearing of silkworms were introduced into France in the reigns of Louis XI. and Francis I., but did not prosper greatly; the extraordinary progress of the in-

dustry in that country at a later date was due to the protective policy of Jean Baptiste Colbert (1619-83). The English manufacture, which had been established in the 15th century, received a great stimulus from the immigration of Flemish weavers in 1586, and still more from the influx of skilled French artisans which followed the revocation of the Edict of Nantes (October 18th, 1685). These mostly settled in Spitalfields, and the industry afterwards extended to Coventry, Derby, Macclesfield, Congleton, Leek, and other provincial towns. Since the French treaty of 1860, which admitted French silks duty free, the English trade has greatly declined. France holds the foremost rank among silk-manufacturing countries, contributing between one-third and one-half of the textures produced throughout the world; to a large extent these are made from raw silk produced on French soil.

Silk-Cotton, the silky hairs covering the seeds of the tropical American species of *Bombax*, a genus of Sterculiaceæ, an order related to the Malvaceæ, to which cotton belongs. That from *B. malabaricum* is known in Holland as kapok. It is used for stuffing beds, pillows, etc.

Silkstone, a town of the West Riding of Yorkshire, England, 4 miles W. of Barnsley. The parish abounds with coal of excellent quality, and mining forms the prevailing interest. It was in one of the collieries here that the great Coal Strike Riots of 1893 broke out in the month of August. The colliery was guarded by police day and night, and a company of soldiers was quartered in the district as an additional precaution. The church of St. Nicholas contains some varied architecture. The buttresses are Late Decorated, with quaint gargoyles; there is a Norman arch on the north side of the chancel; on the south side a Perpendicular arcade conducts to a chapel that once belonged to the Wentworths; and the roofs of the nave and the aisles and the oak rood-screen contain some choice examples of Perpendicular timber work and carving. In the church a memorial has been erected to Joseph Bramah, inventor of the lock named after him, who was born here in 1749. Pop. (1901), 1,698.

Silkworm. [SILK.]

Silliman, BENJAMIN, scientist, was born in North Stratford (afterwards Trumbull), Connecticut, United States, on August 8th, 1779, and after being educated at Yale College, and making a tour in Europe, he settled down as professor of chemistry at that institution, to which he had been appointed in 1802. In 1818 he started *Silliman's Journal*, for many years the chief scientific periodical in America, and he delivered hundreds of popular lectures on chemistry and geology. In 1853 he retired from his professorship, and in the same year published an interesting record of his last visit to Europe in 1851. He was a prominent abolitionist, but died at New Haven, Connecticut, on November 24th, 1864, before his views had

triumphed. His son Benjamin, born at New Haven in 1816, succeeded him as editor and professor, wrote several useful manuals, chiefly on chemistry, and died at New Haven in 1885.

Silloth, a seaport of Cumberland, England, 19 miles W. of Carlisle, of which it may be regarded as the port. It is almost wholly of modern creation, consisting so recently as 1837 of only a few scattered houses. After the railway came to it, docks and a harbour were constructed, and there is not only regular communication with Liverpool and Dublin, but a thriving export and import trade. Owing to its healthy climate, it has become a watering-place and holiday resort of repute, and possesses an excellent golf-course and tennis courts. One interesting item is the export from the Solway Firth of sea-turf, which is justly in high esteem for the laying of bowling-greens in London and other parts of England. Pop., 2,700.

Siloam, a rock-cut reservoir in the south-east of Jerusalem. It measures 52 feet by 18 feet, but was once 52 feet square. It communicates by means of a channel hewn in the rock and leading south-eastwards with a larger receptacle which was known as the Old Pool. Formerly its water was sweet and abundant. It was undoubtedly supposed to possess healing virtues, but its flow, probably owing to the season of drought frequent in such a country as Palestine, was intermittent. Since the 12th century the water has suffered from the neglect that has overtaken so many things in the Holy Land, both natural and artificial, and is now foul and bitter. An interesting discovery was made in 1880, when a Hebrew inscription, in Phœnician letters, was found on the wall of the tunnel, under the old city wall on the ridge of Ophel, conveying the water from the spring known as the Virgin's Fount to Siloam. When deciphered it was a record, conjectured to have been cut by the workmen themselves, of the construction of the tunnel in the 7th century B.C.

Silphids, or CARRION BEETLES, a family of beetles belonging to the group Necrophaga, and including the largest of the Burying Beetles; these belong to the genus *Necrophorus*, which are often an inch in length. Some species are to be seen in England, the handsomest having broad bands of bright orange and rows of yellow hairs. Henry Walter Bates, the eminent naturalist, thus describes the process of burying:—"If we would see them in greater number, and at work, we have only to place upon light soil in a field, in some suitable situation known to be favourable to insects generally, a dead mouse, or similar small animal, and examine it a day or two afterwards. If the weather be fine, a number of *Necrophori*, sometimes of two or three distinct species, may then probably be caught in the act of burying the dead body. If we luckily time our visit at the commencement of the operation, we shall see them flying one by one from a distance, and settling near the edge of the carcass. They proceed by excavating the

soil around and underneath until, in a few hours, by the force of gravity, or by dint of various tugs by the beetles themselves, the body is lowered, in some cases to the depth of a foot, and the loose soil closes over it." The mother beetles then lay their eggs in the carcass, every scrap of which is devoured, the number of beetles thus engaged depending on the size of the buried body. Some small members of the family are less than one-sixth of an inch in length; these belong to such genera as *Choleva* and *Colon*. The family also comprises a group of Cave beetles, which are blind and found only in the remote parts of the caves in Carniola, concealed in fissures of stalagmites, or clinging to stalactites on the walls. They walk slowly, their body raised on their long legs, and when a sound is heard suddenly lie flat on the ground, with outstretched legs and raised antennæ. They are of the pallid colour which characterises cave insects.

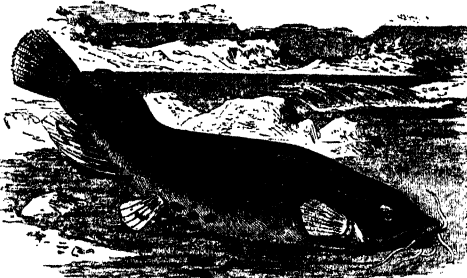
Silures, the original inhabitants of South-Eastern Wales and the ancient territory in England. They were dark, curly-haired, and probably of the pre-Aryan Iberian or Basque stock, though they assimilated with the Celts in course of time. They were a warlike folk, and offered stout resistance to the Roman invaders.

Silurian System, the name originally applied by Sir Roderick Impey Murchison in 1835 to those rocks below the Old Red Sandstone that occupy the former territories of the Silures on the South Wales border. He afterwards extended the name downwards to all rocks below the Old Red Sandstone that contain trilobites, thus including the equivalents of the rocks described by Professor Adam Sedgwick under the name of Cambrian in North Wales. To obviate this conflict of nomenclature, when it had been shown by Mr. Etheridge that between the Archæan and the Old Red Sandstone there are three distinct faunas, the name Ordovician was proposed by Professor Charles Lapworth for the Lower Silurian of Murchison or Upper Cambrian of Sedgwick. As now defined, the Silurian system is a series of sandstones and shales, with three bands of limestone, having a total thickness of from 5,500 to 7,000 feet, occupying in England a large area on the Welsh border, and in the Lake district, and found in deep borings to the north of London. Its sub-divisions are as follows:—

| | FEET. |
|---|--------------------------------------|
| Ludlow Series , with | Ledbury Shales 300 |
| Kirkby Moor Flags | Downton Sandstones 100 |
| and Bannisdale Slates. | Upper Ludlow Shale with bone-bed 900 |
| | Aymestry Limestone 30-40 |
| | Lower Ludlow Shale 900 |
| Wenlock Series , with | Wenlock or Dudley Limestone 100-300 |
| Denbigh and | Wenlock Shale 640-1,400 |
| Coniston Grits. | Woolhope or Barr Limestone 40 |
| | Tarannon Shale 1,000-1,500 |
| Upper Llandovery, or May Hill Series | 1,500 |

Besides May Hill, in Gloucestershire, the Lickey Hill quartzite, in Worcestershire, belongs to the Upper Llandovery sandstone series. The limestones of the Wenlock series, which though thin are crowded with fossils, are burnt into quicklime. The bone-bed in the Upper Ludlow, though less than a foot thick, is traceable over 1,000 square miles to the south of Ludlow. There is an unconformity at the base of the series, and though near Ludlow it passes conformably up into the Old Red, in North Wales it has been tilted, crumpled, faulted, and cleaved before being covered by that formation. Land plants are represented in Silurian rocks; a fish has been found in the Lower Ludlow, and others occur in the bone-bed; *Palæchinus*, a sea-urchin, occurs in the Upper Llandovery; and *Pseudocrinites*, a cystidean, in the Wenlock Limestone. This light grey limestone is full of corals, crinoids, trilobites, and brachiopods, and also contains the eurypterids, *Eurypterus* and *Pterygotus*. The chief corals are *Omphyma*, *Favosites*, and *Halysites*; the chief trilobites *Calymene*, *Phacops*, *Homalonotus*, and *Illænus*; the chief brachiopods *Orthis*, *Rhynchonella*, *Strophomena*, *Atrypa*, and *Pentamerus*; and the chief cephalopod is *Orthoceras*.

Siluroids, a large family (Siluridæ) of Physostomous Fishes, chiefly from the rivers and lakes of all temperate and tropical regions, though a few are coast fishes. The skin is without scales;



MALAPTERURUS ELECTRICUS

barbules are always present, and there may be an adipose fin. The Sheat-fish (*Silurus glanis*), the European Siluroid, found in rivers east of the Rhine (though there is a record of one being taken in a tributary of the Shannon and it used to occur in Haarlem Meer in Holland), attains a weight of from 300 lbs. to 400 lbs., and its flesh is well-favoured. It has been captured in the Bug sixteen feet long, and it is stated that one seized near Thorn, on the Vistula, contained the entire body of an infant, while in another, caught in Hungary, was found the body of a woman with a purse full of money at her girdle. The fat is used in dressing leather, and from the air-bladder gelatine is made. Two species of Charias, from the Ganges and East Indian Archipelago, when the water dries up, make their way over the mud in search of water by means of their fins, when they are readily cap-

tured. The Electric Siluroid (*Malapterurus electricus*) is found in the Nile and the rivers of the west coast of Africa. The electric organ extends over the whole body, and is placed below the external skin. The creature, however, is dangerous only to small animals. Its flesh is edible, and the natives value it for its imaginary healing properties, which are developed by burning the tissue and allowing the patient to inhale the fumes. Most of the South American Siluroids are small.

Silver (chemical symbol, AG; atomic weight, 107.93). This metal has been known since very early times; it is frequently mentioned in the Mosaic and other Scriptural writings, while often in the other works of antiquity notice of it occurs. The sources whence the ancients obtained their supplies are not certainly known; Spain appears then, as now, however, to have been one of the chief seats of its production, while Nubia, Ethiopia and Greece also possessed silver mines. Small quantities only occur in Great Britain, though mention of former silver mines is made by Strabo. The principal localities now noted for the presence of silver ores are Spain, Hungary, the Harz, the Urals, Saxony, Mexico, Peru, Colorado, Nevada, New South Wales and Queensland, while it is also found largely in numerous other districts. The metal seldom occurs in the free state, but is sometimes met with, crystallising in forms derived from the Cubic system. Its chief ores are the sulphide, or silver-glance, and chloride, or horn-silver. A crystalline compound with mercury is also found in Sweden, Spain, Chile, etc., which possesses a variable composition, and is known as "amalgam." The ores are usually associated with large quantities of other metals, so that they never contain more than a small proportion of the theoretical amount of silver. It occurs to a small extent in most lead ores, and large quantities of the metal are obtained in lead-smelting, as the lead can be profitably desilverised when the proportion of silver is as low as a few ounces to the ton. [PATTINSON'S PROCESS; PARKES'S PROCESS.] For the extraction of silver from its own ores, the methods are well perfected, and can be performed on ores with only .05 per cent. of silver. The processes differ, however, with the various ores and local conditions. Silver is, when pure, a bright white metal with a high lustre. It is very ductile and malleable, and is capable of being hammered into very fine sheets and drawn into very thin wire. It has a specific gravity of 10.5 to 10.6, and is an excellent conductor of both heat and electricity. It melts at a temperature of 1,000° C., and at a higher temperature volatilises with the formation of a purplish blue vapour. It is very stable, and does not rust in moist air; it becomes coated, however, with a film of black sulphide if exposed to the action of sulphur compounds, and to this is due the blackening of silver articles in rooms where gas is burnt. It alloys very readily with other metals; the silver employed in English coinage consists of an alloy of 92.5

silver, with 7.5 of copper, most foreign coins containing a smaller quantity of silver. Silver containing 11 oz. 2 dwt. silver to the pound (Troy) is known as "sterling" silver, and is stamped with the "Hall mark" of a Lion, or if 11 oz. 10 dwt. (95.5 per cent.) of Britannia. If melted in air, silver absorbs oxygen to the extent of twenty-two times its volume, the whole being again liberated when the metal solidifies. It dissolves readily in nitric acid, forming silver nitrate, which crystallises in soluble triclinic tablets and is the most important salt of silver. Fused and cast in sticks, it is known as lunar caustic and employed as a cautery. The chloride, bromide and iodide are all insoluble in water, and are extensively used in photography. The metal is employed in multifarious ways in the arts, crafts and industries. It is usually detected by the precipitation of its insoluble chloride by hydrochloric acid, and may be estimated either in the same way or by the dry method known as cupellation.

Simalu, or PULO BABI (the Malay name having been given to it in reference to its shape, *babi*, meaning "hog"), an island of the Dutch East Indies, 70 miles off the nearest point of the north-western coast of Sumatra. It is of volcanic origin, and is comprised in the province of Great Atcheen. It yields a variety of tropical products, and particularly a tobacco of choice quality, for which the soil, largely composed of decayed pumice stone, appears peculiarly adapted. The principal plantation belongs to a British company. On January 21st, 1907, a tidal wave of extraordinary proportions destroyed the southern shore, the off-lying and smaller island of Simalu Tchoot being wholly engulfed. It was found almost impossible to calculate the loss of life caused by this calamity, but it was estimated at no fewer than 1,500 persons.

Simancas, a town of the province of Valladolid, Spain, on the Pisuerga, a right-hand tributary of the Douro, 8 miles S.W. of Valladolid. It is of peculiar interest as being the depository of the national archives of Spain, which have been kept since 1563 in a building, formerly a castle, called Archivo General del Reino. They comprise over 30 million documents, and occupy some fifty rooms, and consist not only of State papers, but also of much private correspondence. The archives are open to inspection and examination. Pop., 1,250.

Simbirsk, a government of Russia in Europe, bounded on the N. by Kazan, on the E. by Samara, on the S. by Saratov, and on the W. by Penza and Nijni-Novgorod. The Volga is a natural boundary on the east. The province occupies an area of 19,110 square miles. Though nowhere exceeding 1,000 feet in height, the surface is hilly in the east, and in other parts an undulating plain, with tracts of forest in the north and lakes and marshes in the west. The principal rivers are the Sura, Sviyaga, Usa, and Syzran. Agriculture is the leading industry,

the chief crops being rye, oats, potatoes, wheat, and barley, while of the live-stock the breed of horses is excellent and in brisk demand. The industries include flour-milling, distilling, tanning, and the making of glass and starch. Village manufactures comprise, amongst others, all kinds of wooden ware, boots, gloves, metal goods, ropes, and fishing nets. The capital, Simbirsk (44,111), stands on a hill commanding a fine view of the Volga, and is rather an attractive town owing to the numerous gardens laid out in different places. Pop., 1,547,817.

Simeon, CHARLES, evangelist and commentator, fourth son of Richard Simeon, was born at Reading, Berkshire, England, on September 24th, 1759. Educated at Eton, whence he went in January, 1779, with a scholarship to King's College, Cambridge, he succeeded, in 1782, to a Fellowship, which he held until his death. To a conscientious preparation for his first communion at the University, helped by a careful study of Bishop Wilson's manual on *The Lord's Supper*, Simeon's conversion was due. Easter Day, April 4th, 1779, was often referred to by him as "a season much to be remembered," "when my deliverance was complete," and he soon became distinguished for his passionate evangelicalism. He was ordained deacon in 1782, and priest in 1783. After serving as honorary curate in the parish of St. Edward's, he was appointed minister of the Church of the Holy Trinity, Cambridge, by his father's friend, Bishop James Yorke, of Ely. The parishioners wished the then assistant curate appointed; Simeon had been willing to make him his "substitute" and allow him all the profits of the benefice. The parishioners imperatively petitioned the bishop, but he was not to be coerced, so they chose the assistant priest as lecturer, an office which still exists apart from the incumbency. On Sunday mornings, when Simeon had a right to the pulpit, his rival's supporters absented themselves, and locked the pew-doors, leaving only the aisles for the congregation which might assemble. Insulted in the streets, Simeon found scarcely a house open to him, and comforted himself during years of admirable patience with the thought, "The servant of the Lord must not strive." His piety wore down opposition, and his benevolence during the famine of 1788 conciliated his adversaries. Simeon's distinctive principles made him widely known, and he became an acknowledged leader. When Charles Grant was appointed a director of the East India Company, Simeon was invited to act as his adviser in the selection of chaplains, and he induced Henry Martyn and other capable men to undertake mission work in India. This eventually led to the formation, in 1799, of the Church Missionary Society for Africa and the East, founded chiefly by Simeon and John Venn. It was soon the most important missionary agency of the Church of England, a position it honourably maintains. When the British and Foreign Bible Society was founded, in 1804, it was regarded with suspicion; but Simeon per-

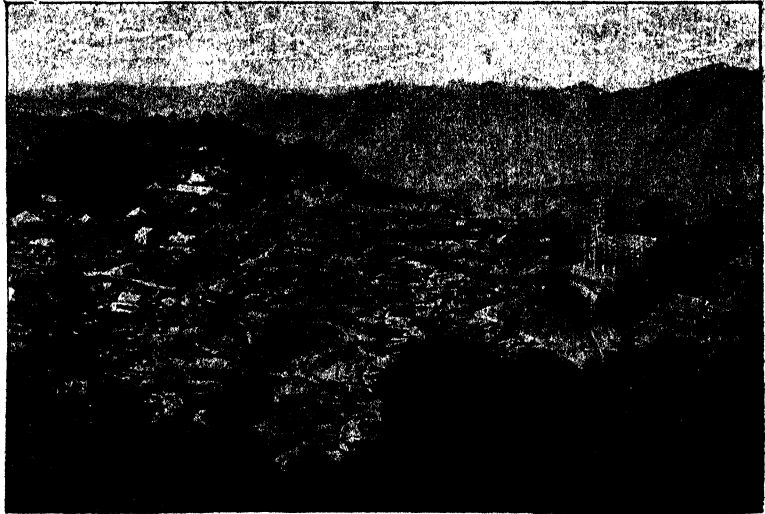
sued his fellow-Churchmen to support it, and remained its steady friend. On his first visit to Scotland, in 1796, he preached in the pulpits of the Church of Scotland upon this principle: "Presbyterianism is as much the established religion in North Britain as Episcopacy is in the South, there being no difference between them except in Church government." With Mr. Haldane he went on a tour. They climbed Ben Lomond, "then went to prayer and dedicated ourselves afresh to God," and then surveyed the view, which they considered "inexpressibly majestic." On his second visit to Scotland the Moderate majority in the General Assembly prevented him from preaching in their churches. He held his living for fifty-four years, exerting an influence which is still felt by the foundation of a body of trustees who administer the patronage they have acquired in accordance with his views. He died in his rooms at King's College on November 13th, 1836, and was buried in the great vault beneath the antechapel. Besides various tracts and devotional treatises his great work was a series of 2,536 sermons, forming a commentary on the Old and New Testaments, entitled *Horæ Homileticæ*, for the copyright of which he was paid £5,000, three-fifths of which he devoted to missionary purposes.

Simferopol, capital of the province of Taurida, Russia-in-Europe, on the left bank of the Salghir, Crimea, 35 miles N.E. of Sebastopol. It was originally a Tatar settlement called Ak-metchet (White Mosque), but was captured by the Russians in 1736, and, after the conquest of the Crimea in 1784, received its present name. It has a well-built European quarter and an uninviting Tatar quarter. It occupies a picturesque site in beautiful surroundings. The manufactures are inconsiderable. Pop. (1900), 60,876.

Simia, a Linnean genus comprising all the apes and monkeys, which is now restricted to the Orang Outan.

Simla, a British sanatorium, the capital of a district of the same name, in the Delhi division of the Punjab, India. The district has an area of 102 square miles, and occupies a spur of the Central Himalaya. The town of Simla stands at

a height of 7,084 feet above sea-level, and is 170 miles N. of Delhi, and 58 miles N.E. of the railway station at Kalka, which is 1,116 miles N.W. of Calcutta. It is superbly situated on a crescent-shaped ridge, terminating eastwards in the peak of Jakho (8,000 feet), clothed with deodar, oak, and rhododendron, and ending westwards in the grassy height of Prospect Hill.



SIMLA: GENERAL VIEW FROM JAKHO.

(Photo: Bourne & Shepherd, Calcutta.)

Such is the beauty of the northern offshoot, running at right angles to the main ridge, that it has received the epithet of Elysium. Since the administration of Lord (then Sir John) Lawrence, in 1864, Simla has been the summer capital of the Government of India. The principal structures are the Viceregal Lodge, the Foreign Office and other Government buildings, the Town Hall, the English Church, the Ripon Hospital, the Bishop Cotton School, the Mayo Industrial Girls' School, and several other educational institutions. The industries consist of brewing and printing, and considerable trade is done in catering for the requirements of visitors, while there is export of opium, fruit, nuts, and fine wool for shawls. Pop., about 15,000, probably doubled during the season.

Simon, or SIMEON, the son of Cleophas and Mary, spoken of as the brother of Jesus, was one of the first disciples. After the death of James he was elected bishop of the Church of Jerusalem, which he governed for over forty years, suffering martyrdom, so tradition tells us, under Trajan about A.D. 107.

Simon, JULES, or FRANÇOIS JULES SUISSE, statesman, was born at Lorient, department of Morbihan, France, on December 27th, 1814, and became a teacher at Rennes, whence he

passed to the École Normale in Paris at the invitation of Victor Cousin, whom he succeeded as Professor of Philosophy at the Sorbonne (1839). In 1847 he left literature for politics, founded *La Liberté de Penser*, and entered the Chamber in 1848 as Deputy for the Côtes-du-Nord, joining the Moderate Left. The *coup d'état* for a time excluded him from public life as a teacher or a legislator. He retired to Nantes and devoted himself to writing, publishing *Le Devoir* (1854), *La Religion Naturelle* (1856), *La Liberté de Conscience* (1857), *La Liberté* (1859), and *L'Ouvrière* (1861). In 1863 he was returned as Deputy for the Seine, and at once took the lead of the Ultra-Liberals and Free Traders. In the Government of the Defence he became Minister of Public Instruction, Worship, and Fine Arts, and resumed that post under Thiers. In 1875 he was chosen a life senator, and at the end of the year formed a Ministry, which lasted until 1877. In 1879 he opposed Jules Ferry's bill for suppressing non-authorised religious bodies, and evinced a strong interest in labour questions and the development of Socialism. He was made an Academician in 1875, and secretary of the Moral Science branch in 1882. In the scanty leisure of his public life he contrived to produce several books of great interest and importance, amongst them being *Le Travail* (1866), *La Famille* (1869), *Le Livre Échange* (1870), *Dieu, Patrie, Liberté* (1883), and *Victor Cousin* (1887). He edited the *Sicèle* from 1875 to 1877 and the *Gaulois* from 1879 to 1881, and was a frequent contributor to the *Matin*, *Journal des Débats*, *Temps*, *Figaro*, and other newspapers. He died in Paris on June 8th, 1896.

Simon, RICHARD, father of Biblical criticism, was born at Dieppe, France, on May 13th, 1638. His education began under the Fathers of the Oratory in that city and, his talents winning early recognition, he was enabled to pursue his studies in theology and Oriental languages in Paris, where, in 1659, he entered the Congregation of the Oratory. The encouragement shown to him aroused the jealousy of his fellow-students, but he continued his course, and when it was ended was sent to lecture on philosophy in the college at Juilly. He was soon recalled to Paris, and employed in cataloguing the Oriental MSS. belonging to his Order. The result of this opportunity for further study of his favourite subjects appeared later. In 1670 he entered the priesthood, and in the same year wrote in defence of some Jews at Metz, against whom the oft-repeated cruel charge of murdering a Christian child had been brought. In 1678, being blamed for having, it was said, compromised the Oratorians by his writings, he withdrew from that body and retired to the curacy of Belleville. Endowed with great learning and a remarkable memory, his bitterness tended to exasperate controversialists. His criticism of Arnauld's work on the Eucharist aroused much indignation, which was increased by his interference in a lawsuit in which a friend of his was engaged

with the Benedictines. But the scandal caused by his *Histoire Critique du Vieux Testament* (1678) led the Oratorians to declare he was no longer a member of their Order. This work consists of three books: i., dealing with the text and questions of criticism; ii., an account of the principal translations; iii., an examination of the principal commentators. Simon remarkably anticipated the speculations of German rationalism, disputing the Mosaic authorship of the Pentateuch, and assailing tradition and the writings of the Fathers. Roman Catholics and Protestants alike were aroused by his frequently sarcastic assaults on the integrity of the Hebrew text, and when, through Bossuet's influence, the *Histoire* was suppressed in France, it was published in 1685 in Rotterdam. His *Histoire Critique du Texte du Nouveau Testament* appeared in 1689, and his *Histoire Critique des Principaux Commentateurs du Nouveau Testament* (1693), considered the most important of his many works (often published under assumed names), is still of value to scholars. Simon died at Dieppe on April 11th, 1712.

Simonides of Ceos, a Greek philosopher and poet, was born at Iulis, in the island of Ceos, in 556 B.C. He was a very accomplished man, and enjoyed the friendship of his most distinguished contemporaries, excepting Pindar, who seems to have been envious of his success and to have spoken slightly of him. He died at Syracuse, in Sicily, in 469. He is credited with the invention of the Greek letters eta (the long e) and omega (the long o). He excelled in elegiac verse, and is said to have competed successfully against Æschylus. **SIMONIDES OF AMORGOS**, a satirical poet, flourished about 660 B.C. He was a native of Samos, and afterwards settled in the island of Amorgos, with which his name is customarily linked.

Simon Magus, or **THE SORCERER**, a native of Samaria, and probably a Gnostic, was practising his magical art in his native country when Philip the Evangelist began to preach and perform miracles. Simon professed to be converted and was baptised, but, on his offering money to Peter for the gift of the Holy Spirit, he was excommunicated. He then returned to his old errors, upon which he grafted a system of his own—the Æons or intermediate spirits, governing the world under the Supreme Deity, being one of his inventions. The ecclesiastical sin of simony derives its name from him.

Simon's Town, a naval station on Simon's Bay, an inlet on the western side of False Bay, 20 miles S. of Cape Town, Cape Colony, South Africa. False Bay is an arm of the sea to the south of Table Mountain, corresponding to Table Bay to the north of it, is protected from all quarters save the south, and provides safe anchorage for the largest vessels. The forts and batteries on the heads (the Cape of Good Hope being the western and Cape Hang-Klip the eastern) afford complete protection to the station. Pop. (estimated), 4,000.

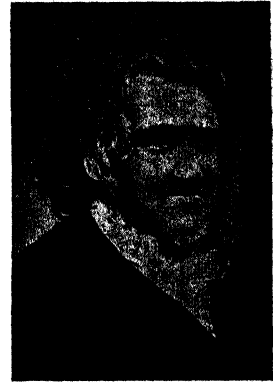
Simony, the act or practice of trafficking in sacred things, with particular reference to the buying or selling of ecclesiastical preferment, or the purchase of ordination, or the presentation of anyone to an ecclesiastical benefice for money or other reward. Though an offence against the law of the Church, and forbidden by many Councils, and severely punishable ecclesiastically, yet there were no more notorious simoniacs than some of the Popes. The word is derived from Simon Magus, who proposed to purchase the gift of the Holy Ghost.

Simon Zelotes, or **THE CANAANITE**, is an apostle of whom little is recorded. The two names by which he is known are really identical, and probably indicate that he belonged before his conversion to a fanatical and lawless sect among the Jews; though many modern critics consider that the alternative title should not be Canaanite at all, but Cananæan, implying thereby a man of Canan or Cana. In ecclesiastical tradition he is generally mentioned along with Judas or James.

Simoom, or **SIMOON**, a hot wind occurring in the hot sandy regions of Africa, Arabia, and parts of Asia. The sand, under the scorching rays of the sun, gets extremely hot. It is too bad a conductor to allow the heat to pass downwards, and the absence of water prevents it from becoming latent in atmospheric moisture. Hence the top layers become enormously hot, the temperature sometimes rising to 200° F., nearly the boiling-point of water. Currents of hot air rise, and more air rushes in to supply their place; the result is that hot columns of air, laden with stifling clouds of sand, are swept across the country, causing immense destruction to animal and vegetable life. Extensive caravans are often destroyed, and even whole armies have been known to perish before it. Its advent is usually signalled by the appearance of a rapidly-spreading haze, extending from the horizon till the whole sky is obscured by it; then follow hurricanes with their fearful columns of heated sand. The sirocco of Italy, solano of Spain, and samiel of Turkey are merely modifications of the dread simoom. The hot winds of the Sahara get saturated with vapour in their passage across the Mediterranean, and appear as the hot, moist, enervating sirocco of Sicily and Italy.

Simplon (German, *Simpeln*), a mountain pass in the east of the canton of Valais, Switzerland, forming part of the Lepontine Alps. The famous road, 38 miles in length, and reaching a height of 6,885 feet, leads from Brieg in Valais to Domo d'Ossola in Piedmont. It was constructed by Napoleon between 1801 and 1807. The Simplon railway tunnel, begun in 1898, was opened on May 19th, 1906, by the King of Italy. On the Swiss side it enters the mountain at Brieg, and on the Italian at Ielle. It is 12½ miles long, the highest point it reaches is 2,312 feet, and it cost £4,000,000.

Simpson, **SIR JAMES YOUNG**, physician, was born at Bathgate, Linlithgowshire, Scotland, on June 7th, 1811. His father was a baker in humble circumstances, but by dint of rigid economy the family sent James to Edinburgh University at the age of fourteen. He had a brilliant career in the medical faculty, and graduated M.D. in 1832. In 1835 he was elected senior president of the Royal Medical Society of Edinburgh, and, four years later, was appointed to the chair of Midwifery in the University, a post he retained till the end of his life. In 1847, as the result of experiments on himself and his assistants, he was enabled to introduce the use of chloroform as an anæsthetic, one of the most beneficent discoveries ever made. It is extraordinary to think, in the light of universal experience, that Simpson had to contend strenuously with the combined forces of dogmatic theology and shallow superstition before he established the incalculable advantages of the new drug. He introduced many improvements in the practical branch of obstetrics, and foreshadowed the discovery of the Röntgen rays. His proposal of acupressure (1859) as a means to arrest surgical hæmorrhage by the pressure of needles did not ultimately commend itself to the profession. In 1866 he was created a baronet, and at his death, on May 6th, 1870, was accorded the rare honour of a public funeral by the city of Edinburgh. He was interred in Warriston cemetery, in the north side of the town. He was a man of winning personality, of middle height, and had the head of a lion. His hobby was the study of antiquities, and in 1873 a collection of his *Archæological Essays* appeared under the editorship of Dr. James Stuart.



SIR JAMES YOUNG SIMPSON.
(Photo: J. Moffat, Edinburgh.)

Simrock, **KARL JOSEPH**, poet, was born at Bonn, Rhenish Prussia, Germany, on August 28th, 1802, and studied at the universities of Bonn and Berlin. He entered the civil service of Prussia but, having been expelled for writing a poem in praise of the July revolution, devoted himself to the study of early German literature, and in 1827 produced an edition of the *Nibelungenlied*, which was subsequently enlarged and improved. In 1850 he was appointed professor of Old German literature at Bonn, and edited the chief poems and legends of the Fatherland, e.g., *Parsifal*, *Reineke Fuchs*, *Tristan und Isolde*, the *Minnesingers*, and the *Wartburgkrieg*. He also translated Shakespeare and the *Frithiof Saga*. He died at Bonn on July 18th, 1876.

Sims, GEORGE ROBERT, journalist and playwright, was born in London on September 2nd, 1847, and educated at Hanwell College and Bonn. In 1874 he was attached to the staff of a weekly humorous periodical called *Fun*, then edited by Tom Hood, a son of the great poet. In 1877 the *Referee*, a well-known London weekly paper devoted to sport, the drama, and things in general, was founded, and Sims contributed every week, under the pseudonym of "Dagonet," a series of notes entitled "Mustard and Cress," which became one of the most popular features of the paper. They were as pungent as their title, and often partook of an autobiographical character. He wrote also regularly for the original *Weekly Dispatch* and other newspapers and periodicals. He has frequently been instrumental in directing public attention to topics of first-rate importance, as in the cases of Adolf Beck (*The Daily Telegraph*) and the scandalous and cruel rearing of poor children (*The Tribune*). Many of his journalistic articles were afterwards published in volume form, such as his *Dagonet Ballads*, which had an enormous vogue in the days of "penny readings," *Three Brass Balls*, and *The Memoirs of Mary Jane*. His knowledge of London is unique, and the book on *Living London* which he edited for Cassell and Company is a standard work on the social aspects of the metropolis. He has produced several successful melodramas and other plays, amongst them being *Lights of London*, *In the Ranks*, *Harbour Lights*, *Little Christopher Columbus*, *The Trumpet Call*, *English Rose*, *Two Little Vagabonds* and *Dandy Fifth*.

Simson, ROBERT, mathematician, eldest son of John Simson, of Kirktonhall, Ayrshire, was born on October 14th, 1687. Being intended for the ministry he entered Glasgow University and studied under his uncle John Simson, professor of Divinity. Preferring mathematics to theology, however, he came to London to pursue his studies, became acquainted with Edmund Halley and other eminent men, and on his return to Glasgow, on the resignation of Robert Sinclair, was elected professor of Mathematics in the university on March 11th, 1711. He graduated M.A. in the same year, and in 1746 the University of St. Andrews conferred on him the honorary degree of M.D., because in his youth he had studied botany. In 1761 he resigned his professorship, and died, unmarried, on October 1st, 1768. His first work was an attempt to restore Euclid's lost treatise on *Porisms*, which are only known from the obscure hints given by Pappus of Alexandria of what a porism was. This class of propositions, highly valued by the ancients, had for long baffled mathematicians. Simson defined a porism as "a proposition in which it is proposed to demonstrate that some one thing or more things are given, to which, as also to each of innumerable other things, not indeed given, but having the same relation to those which are given, it is to be shown that there belongs some common affection described in the proposition." Naturally this led to much

discussion. His treatise *De Porismatibus Tractatus* was published among his posthumous works in 1776. In 1735 his *Sectionum Conicarum Libri V.* appeared; in 1738 his restoration of Apollonius's *Plani Loci* was completed, and his best-known work, an edition of the *Elements of Euclid*, was issued in 1756, to which, in 1762, he added the *Data*. For over a hundred years its accuracy made this the basis of later textbooks.

Sinai, MOUNT, a peninsula between the Gulfs of Suez and of Akabah, arms of the Red Sea. It measures 140 miles from north to south, its contour presenting the outline of an inverted pyramid, Ras Mohammed, its southern ex-



MOUNT SINAI.

(Photo: Frith & Co., Reigate.)

tremity, being the apex. It is in general a mountainous wilderness of forbidding aspect. Towards the south is the mass of granitic peaks upon which attention is universally centred, since one must have been the scene of the giving unto Moses of the Tables of the Law. The principal peaks are Jebel Serbal (8,732 feet) in the west, Jebel Katherin (8,537 feet), and Jebel Shomer (8,449 feet). Opinions are divided as to which is the Mount of the Law. Many modern critics favour Serbal, but tradition points to Jebel Musa (Moses' Mountain), the southern peak of Katherin, as the sacred hill, the northern peak being known as Mount Horeb. Jebel Musa is about 7,500 feet, and on its eastern flank stands a famous Greek monastery.

Sinaloa, a maritime state of Mexico, bounded on the N. by Sonora, on the E. by Chihuahua and Durango, on the S. by Tepic (Territory) and the Pacific, and on the W. by the Gulf of California. It embraces an area of 33,671 square miles. In the west the coast is flat and sandy,

but in the east the western flanks of the tree-covered Sierra Madre reach in places a height of 7,500 feet. The streams are numerous, practically all running from the Sierra to the sea, the chief being the Fuerte, Sinaloa, Culiacan, Quila, Mazatlan, and Rosario. Maize, wheat, cotton, tobacco, sugar-cane, coffee, and fruits are cultivated, but the mineral wealth is still greater, and consists of gold, silver, copper, iron, lead, and salt. Culiacan (10,380), the capital, is connected by rail with the port of Altata. Pop. (1900), 296,701.

Sinclair, SIR JOHN, economist, agriculturist and statistician, son of George Sinclair, of Ulbster, was born on May 10th, 1754, at Thurso Castle, Caithness, Scotland. Educated at the High School of Edinburgh and at the Universities of Edinburgh, Glasgow and Oxford, where he matriculated in 1775, he was admitted to both the English and Scottish bars, but having at the age of sixteen succeeded to the family estate, he decided to devote himself to his duties as a landlord and to engage in political life. He was returned to Parliament for Caithness in 1780, and his political career, during which he also represented Lostwithiel and Petersfield, extended until 1811. He married in 1776, and after the death of his wife, in 1785, made a long foreign tour, during which he gathered valuable information on commercial and economic questions. On his return he re-married. His reputation as a financier was made by his *History of the Public Revenue of the British Empire* (1784). The adoption of his plan for the issue of Exchequer bills during the commercial troubles of 1793 saved many manufacturers and others from ruin. His devotion to William Pitt was rewarded with a baronetcy on February 4th, 1786, but subsequent disagreements with that minister led to a rupture. In 1791 he established a society for the improvement of the breeds of sheep in Edinburgh, which, two years later, led to the formation of the Board of Agriculture, Sinclair being nominated its first president. One of the earliest of British statisticians (he introduced the words "statistics" and "statistical" into the English language), he originated and carried through *The Statistical Account of Scotland* (1791-9), which comprised a description of every parish. Its value was recognised by Jeremy Bentham and others, and seems to have suggested a general census. At Pitt's request, in 1794, Sinclair raised a regiment called the Rothesay and Caithness Fencibles, and later a regiment of highlanders. In 1796 he suggested a loyalty loan, but their relations again became strained, and were thus quaintly summed up—"Mr. Pitt valued his simple assent more than his advice." Appointed a member of the Privy Council and Commissioner of Excise in 1810, shortly afterwards he retired to Edinburgh, where he died on December 21st, 1835, and was buried in Holyrood Chapel. He was a voluminous writer, no subject, from politics to poetry, coming amiss to him. The 39 volumes and 367 pamphlets with which he is credited, in-

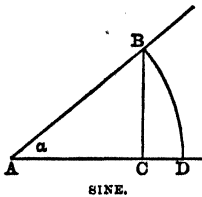
cluding a tragedy, embrace many works which were useful in their day. His energy was unbounded. He began rebuilding Thurso; he founded the herring fishery of Wick; he encouraged sheep farming, and he planted trees.

Sind, also written **SINDH** and **SOINDE**, a division of the Presidency of Bombay, India, comprising the districts of Karachi on the west coast, Thar and Parkar on the east coast, Haidarabad in the centre, and Shikarpur in the north. It covers an area of 47,006 square miles, within which is included the valley of the Indus from Shikarpur to the sea, and the less important basin of the Narra, and the sandy tracts to the east, with the mountainous district on the Baluchistan frontier to the west. The upper parts, under a system of irrigation, are moderately fertile, but the extensive delta of the river yields support for the camel only. In many physical aspects the country resembles Egypt. The principal crops are rice, wheat, millet, pulse, cotton, and oil-seeds, but sugar-cane, indigo, and tobacco are also cultivated. Salt and saltpetre are the only minerals. Sind produces little for exportation except embroidered cloths, nitre, timber, hides, and seeds. Most of the goods shipped at Karachi come from the north and west. Before 1843 it had been ruled by various semi-dependent chiefs, but in that year, after endless disputes, they were brought under British rule by Sir Charles Napier. The province was then divided into districts, and placed under a Commissioner, who is subordinate to the Bombay Government, and has his administrative headquarters at Karachi (116,663). The only other places of importance are Haidarabad, Sukkur, Shikarpur, and Nowshera. Pop. (1901), 3,210,910.

Sindia, or **SINDHIA**, the name by which the Mahratta Maharajahs of Gwalior are hereditarily designated. The fortunes of the family were founded by RANOJI SINDIA, a humble peasant who was taken into the Peishwa's service early in the 18th century. His son, MADHAVA RAO SINDIA, was seriously wounded at the battle of Panipat (1761), when Ahmed, Shah of Afghanistan, overwhelmed the Mahrattas. In 1770 he assisted the Emperor of Delhi to expel the Sikhs from his territory, the administration of which was entrusted to him, and in 1784 he captured Gwalior, and in later years subdued the Rajput states of Jodhpur, Udaipur and Jey-pore. DAULAT RAO SINDIA, who succeeded to the throne in 1794, aspired to make himself the head of the Mahratta Confederacy, and, having a fine army (mainly organised by Frenchmen), began, with his ally, the Bhonsla of Berar, offensive operations in 1802. He was defeated by Sir Arthur Wellesley at Assaye and Argaum in 1803, and both Gobad and Gwalior were captured by Lord Lake. Temporarily pacified, he showed sympathy with the Pindaris in 1817, and lost Asirgarh in consequence. He died childless, as did his successor, JANAKJI, a nominee of the British Government. BHAGTRAT RAO SINDIA, who took the name of Ali Jah Jaiji Rao, was a

distant cousin of Janakji, and, a boy of eight, succeeded in 1843. Protected during his minority by the British, he remained faithful, though driven out by his rebellious troops during the Mutiny. He received the Prince of Wales in 1876, was made G.C.B., G.C.S.I., and appointed honorary general in the British army. In 1886, as a mark of their appreciation of his services, the British Government restored to him the rock fortress of Gwalior, which had been under their surveillance since 1843. He died on June 20th, 1886, and was succeeded by his son, MADHO RAO.

Sine is a trigonometrical ratio by means of which an angle can be measured. If from any point B in one line bounding an angle A, a perpendicular B C be dropped on to the other line, then the ratio $\frac{B C}{A C}$ is called the sine of the angle A. With A as centre and radius A B, we describe the arc B D of a circle, then the old definition of sine referred to it as a function of the arc B D,



while the line B C—not the ratio used above—was said to be the sine of B D. The length, B C, varied with the radius of the circle, but the modern definition overcomes this difficulty, for

$$\text{sine of the angle } A = \frac{\text{sine of the arc}}{\text{radius of the circle}}$$

Singapore, the chief island of the Straits Settlements, lies off the southern extremity of the Malay Peninsula, from which it is divided by a channel about three-quarters of a mile wide, and is about 27 miles long by 14 broad, with an area of 206 square miles. The surface is low, undulating and jungly. The rich soil yields cocoa-nuts, tapioca, gambier, aloes, nutmegs, cacao and all sorts of tropical fruits. The island was purchased in 1824 from the Sultan of Johore for £13,500 and a life annuity of £5,400. Pop. (1901), 228,555. The capital, of the same name, is situated on the southern coast, the roadstead affording safe anchorage. Founded in 1819, it has become one of the most important commercial centres of the East, serving as a depôt for all the exports of Farther India, China, and the Indian Archipelago, and for the imports taken by these countries from Europe. Camphor, indiarubber, rice, spices, coffee, sago, pepper, canes, hides and tortoise-shell are among the chief articles of trade, which is largely conducted by Chinese. The harbour is protected by several forts armed with armour-piercing and medium guns, and by submarine mines. The city contains the Governor's Residence, the Anglican cathedral of St. Andrew, the Law Courts, and botanical and zoological gardens. In further proof of its cosmopolitan character it may be said that places of worship include Chinese joss-houses, Hindu temples, Moslem mosques, besides churches of numerous Christian sects. Nor is recreation neglected, since the city possesses a polo-ground,

racecourse, golf links, fields for cricket and football, bowling alleys and many tennis courts. The mean annual rainfall is 106 inches. Pop. (1901), 193,089.

Singer, ISAAC MERRITT, inventor, was born at Oswego, New York State, United States, on October 27th, 1811. Being of a mechanical turn of mind he devoted years of close application to the improvement of the sewing-machine, and at last patented a single-thread chain-stitch machine, and started a factory in New York. Legal complications followed, but these were eventually compromised, and finally Singer disposed of his interest to a company and removed to Europe, living first in Paris and afterwards at Torquay, in Devonshire, where he died on July 23rd, 1875.

Sing Sing, since 1901 officially known as OSSINING, a town of Westchester County, New York State, United States, on the left bank of the Hudson, 31 miles N. of New York City. It is picturesquely situated on rising ground, and is largely a residential quarter. It has manufactures of machinery and drugs, besides ironfounding, but is chiefly noted as the seat of the great state prison founded in 1825. Pop. (1900), 7,939.

Sinhalese, the inhabitants of the southern half of Ceylon, the northern half being occupied by Tamil intruders from India, take their name from *Sinhaladvipa* ("Lion Island"), one of the old designations of Lanka (Ceylon) in the Hindu writings; Ceylon itself is a corrupt form of the same word. The Sinhalese appear to be a mixed Aryo-Dravidian people, conquered and civilised at an early date by the Hindus. About 300,000 are Roman Catholics, converted during the Portuguese occupation of the island, and 212,000 Mohammedans, converted by Arab missionaries at an earlier period; the rest are Buddhists, Ceylon having remained the chief stronghold of Buddhism in the south after its suppression on the mainland. In 1901 their total numbers were estimated at 2,331,045. They are a mild, inoffensive, and somewhat indolent people, who are being slowly encroached upon by the Tamils of the northern districts.

Sinigaglia, officially SENGALLIA, the ancient *Sena Gallica*, a watering-place of the province of Ancona, division of The Marches, Italy, on the Adriatic Sea, 16 miles W.N.W. of Ancona. The church of Santa Maria della Grazia contains a painting by Perugino, and other buildings are the cathedral of St. Peter and the palace of the Dukes of Urbino. Pius IX. was born here on May 13th, 1792. It was the town of the Galli Senones, and was sacked during the wars of Marius and Sulla. Till 1869 it had been noted for centuries for its annual fair of St. Mary Magdalen (July 20th to August 8th). Pop. (1901), 5,635, only one-fourth of that of the commune.

Sinking Funds are formed by setting aside revenue specially for the repayment of the national debt of the United Kingdom. Sir

Robert Walpole introduced the first (1716). In 1786 William Pitt, misled by the arguments of Richard Price (1723-91), devoted £1,000,000 annually to purchasing Government stock, to be held by commissioners who were to re-invest the interest similarly. Thus, it was argued, the fund would increase at compound interest. This system, however, kept the debt unreduced and so forced up the rate of interest on fresh loans, and was stopped in 1829. Since then attempts have been made to reduce the debt directly out of surplus revenue (as by Sir Stafford Northcote, afterwards Lord Iddesleigh, in 1875), but it is generally held to be unadvisable to accumulate a fund for the purpose, since weak or time-serving financiers are tempted to use it otherwise in emergencies.

Sinope (Turkish, *Sinub*), a seaport on the southern shore of the Black Sea, in the province of Anatolia, Asiatic Turkey, 335 miles W. of Constantinople. Colonised at least five centuries before Christ by Greeks from Miletus, it was an important place until the decay of Greek and Roman civilisation. It was the birthplace of Diogenes the Cynic and Mithradates. It still possesses a naval arsenal, and enjoys some trade in timber, salt, cordage, fruit, silk, hides, fish and oil. The Bay affords the best anchorage on the northern coast of Asia Minor. Here in 1853 a Turkish fleet was destroyed by a superior Russian force. This was one of the immediate causes of the Crimean War. Pop. (1900), 9,749.

Sinus. The term "sinus" is sometimes applied to the cavities which are met with in bones, as, for example, the frontal sinuses; the expression "venous sinus" is used to denote the dilated channels which occur in certain situations, particularly in the skull, and which serve for the transmission of venous blood.

Sion (German, *Sitten*), capital of the canton of Valais, Switzerland, on the Sionne, 15½ miles N.E. of Martigny. On an eminence to the north stand the ruins of the episcopal castle of Tourbillon, built in 1294 and burned down in 1788, and on adjoining hills are the old castle of Valeria, occupying the site of a Roman fort, and the castle of the Majoria (or mansion of the mayor), which was also destroyed by fire in 1788. These castle-crowned heights and its situation generally make Sion one of the most picturesque towns in the country. Amongst prominent buildings are the Gothic Cathedral, which, though dating from the end of the 15th century, has a tower of the 9th century; the church of Notre Dame de Valère, of the 9th to the 13th century; the town hall; the Antiquarian Museum; the church of St. Théodule, and the residence of the Supersaxo family, in which there is a fine Renaissance ceiling of 1505. Pop. (1900), 6,095.

Sioux, one of the great families of the North American Indians, whose chief divisions are given in the article on Dakotas (q.v.). To these must be added the Omahas, Poncas, Kaws (Kansas), Osages, Quapaws, Iowas, Otoes, Mis-

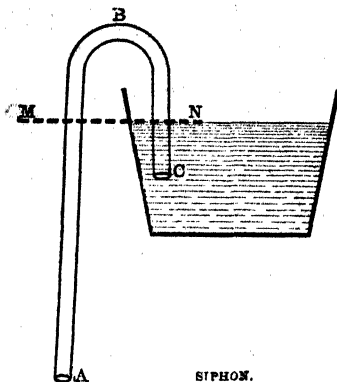
souri, Winnebagos, and Mandans, all now removed to reservations in Nebraska, Indian Territory, Kansas, and Dakota. Their numbers are not estimated at more than 41,000, of whom about 2,000 are in British North America, the rest in the United States. The term "Sioux," now applied under the form Siouan to the whole family, is a Franco-Canadian mutilation of the Algonquin word "nadowessiwag" ("the snake-like ones," "the enemies"). In 1876 a large number of malcontent Sioux, enraged at the invasion of their lands in South Dakota by white prospectors for gold, broke out into open rebellion and caused the War Department to take the field against them. The Indians were reinforced by several Cheyennes, and, under the leadership of Sitting Bull and Crazy Horse, on June 25th, 1876, wiped out a small American force under General Custer at the Little Big Horn. The rebels were now hotly pursued in all directions, and in April, 1877, Crazy Horse surrendered with 2,000 men. Sitting Bull, however, still defiant, contrived to cross the Canadian border, but he returned to Dakota in 1880, and, along with 2,856 followers, surrendered.

Sioux City, the capital of Woodbury county, Iowa, United States, on the left bank of the Missouri, 100 miles N. by W. of Omaha. Among the public buildings are Morningside College, a Methodist Episcopal institution opened in 1890, and Sioux City College of Medicine. The industries include meat-packing and slaughtering, iron-founding, brewing, machine-making, and boiler works, besides manufactures of saddlery and bricks. Pop. (1900), 33,111.

Sioux Falls, capital of Minnehaha county, South Dakota, United States, on the right bank of the Big Sioux, 60 miles N.E. of Yankton. The public buildings comprise, amongst others, Sioux Falls College, Lutheran Normal School, All Saints' School, and Government House. It has manufactures of agricultural implements, vehicles, and flour mills, and there are granite quarries in the immediate vicinity. It is the chief shipping-point for the agricultural produce of a rich farming region. The river descends 100 feet in half a mile, thus constituting the Falls, and supplying enormous power to the factories in the town. Pop. (1900), 10,266.

Siphon is a bent tube used to remove liquids from vessels when it is inconvenient to disturb the vessel. One end of the siphon dips into the liquid; the other end is outside the vessel and is lower than the surface of the liquid inside. The tube may first be filled with the liquid, and the ends *c* and *a* closed, while it is inverted and placed in the position illustrated in the diagram. On opening the ends, liquid will flow from *a* as long as *c* is immersed. As the liquid issues from *a*, it tends to form a vacuum at *b*, but the pressure of the atmosphere at the surface *n* of the liquid forces more fluid up the tube, and so the flow goes on. If *m n* be the level of the liquid, there is at *a* the pressure of the

atmosphere, together with the head of liquid *M A*, tending to drive the liquid out, while only the atmospheric pressure is tending to prevent its fall. The difference between the two is the



head of liquid *M A*, and the liquid issues at that pressure. The height of *B* above *N* must not be greater than the height of a column of liquid which is just supported by the pressure of the air, or the tube *B A* will simply empty itself. If the liquid be mercury, this height must not exceed about 30 inches, and if water the limit is about 33 feet.

Siphonoglyphe, the ciliated groove or furrow at one or both ends of the mouth of various members of the Actinozoa or Alcyonaria. By the vibration of the cilia a current of water is started, and food and fresh water are carried down into the oesophagus. It thus serves both for respiration and nutrition. It can be well seen both in the Sea Anemones and Alcyonium, the "Dead Men's Fingers."

Siphonophora, an order of Craspedote Hydrozoa (that is, Hydrozoa that have a velum or intumed border along the margin of the "bell"), including a number of forms which live on the surface of the seas, mostly in the tropics. They are colonial in habit, and the colonies are characterised by very marked polymorphism, i.e., the different zooids are specialised to serve different functions. They are all free, and as a rule the stem is unbranched, but is often expanded into a float or pneumatophore. The order is divided into four sub-orders:—(1) The Physophorida, including Physophora and others with flask-shaped floats; (2) Physalida, including the Portuguese Man-of-War or Physalia; (3) Discoidea, with disc-shaped floats, such as Velella and Porpita, and (4) Calyptophorida, in which the zooids are placed on an elongated, tubular cenosarc, as in Diphyes, Abyla, etc.

Siphonozooids, those individuals in an Alcyonarian which are much simpler in structure than the normal individuals (autozooids). They have no tentacles or retractive muscles, and are

without reproductive organs. Among the Alcyonaria they occur in the Helioparidæ or Blue Corals, Pennatulidæ, and in some Alcyonidæ.

Siphuncle, the long membranous tube which passes back through the shell of a cephalopod, such as the Nautilus, and establishes a connection between the different chambers. Where it passes through the septa, prolongations of these, known as "collars," pass back and protect it. The position of the siphuncle is of considerable importance, as in Nautilus and its allies it passes through the centre of the septa, while in the Ammonites it cuts them at the margin.

Sipunculus, a genus of worms belonging to the class Gephyrea and the type of the family Sipunculidæ. The three main characters of the family are that the worm consists of only one segment, has no hairs or setæ, and has tentacles around the mouth. A vascular circulatory system is present in most members of the family, and its structure led to the view that Sipunculus and the Gephyreans might be allied to the Holothurians or Sea-Cucumbers.

Sir, an appellation of respect and courtesy, used generally without regard to rank. If spoken emphatically, much will depend upon the tone, for it may then imply reproach, or threat, or anything but respect. Particularly, it is a title of honour prefixed to the Christian names of knights and baronets and very occasionally to the rank itself (as, "Sir Knight"), and was formerly applied to the King (as in the form "sire" it is still so exclusively used). It was once given indiscriminately to bachelors of arts and clergymen (being the free rendering of the Latin *dominus*, "master"). Apparently "sirrah" was at first "sir" uttered with contemptuous force and latterly came to be synonymous with "fellow."

Sir-Daria. [JAXARTES.]

Siren is an instrument which produces a sound by converting a steady current of air or some other gas into a series of discontinuous puffs. This may be done by an arrangement such as that shown in the diagrams. *A B* (Fig. 1) is a cylinder whose top consists of a disc *c d* perforated by a number of holes. Another disc

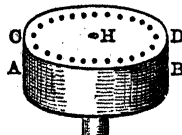


FIG. 1.

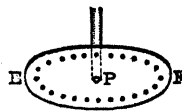


FIG. 2.

e f (Fig. 2) will exactly fit over *c d*, and by means of a pin in the centre *P*, which can rest in a slight hole at *H*, the top disc can rotate quite freely over the lower one. The number of holes in *e f* and *c d* is the same, but their directions are different. If *c d* and *a b* (Fig. 3) be holes in the lower and upper disc, a stream

of air sent up *c d* will strike the side *a* of the upper orifice and so cause the movable disc to rotate. This effect is proportional to the number of perforations in the two discs, since they are all superposed at the same moment. By merely sending air up the tube into the cylinder the upper disc rotates, and, as it moves, the holes in the upper and lower discs are constantly changing from positions of coincidence to disagreement.

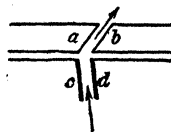


FIG. 8.

Hence the air can only issue from *E F* in puffs, and these puffs produce a certain note. The siren can be used to determine the number of vibrations in a note produced by any means; it is then provided with an apparatus which registers the number of revolutions in any time, and with an adjustment for increasing or decreasing the number of orifices. When the siren is producing a sound exactly in agreement with the other, the number of vibrations per second in both is the number of revolutions of the disc per second multiplied by the number of holes in use. Sirens are frequently used as fog-horns on ships and in lighthouses.

Siren (*Siren lacertina*), a tailed Amphibian, the sole species of its genus, from the swamps of the southern states of the United States, especially frequenting the stagnant waters and marshy ground of South Carolina, where rice is cultivated. The form is eel-like, hind limbs are absent, and gills persist throughout life. Its average length is 18 inches, but specimens three feet long are not uncommon. Though it lives in the mud, it travels into the water, in which it is a deft swimmer, and sometimes on land, feeding on earthworms and insects. When it has to inspire it rises to the surface, about three times in 12 hours, and gets rid of some air under water about once in two hours. Its body is covered with thick mucus of disagreeable smell. In pre-Abolition times the Sirens were killed by the slaves, or mangled as poisonous and left to be devoured by birds and beasts of prey.

Sirenia, an order of marine Mammals, resembling the whales and dolphins in form, but without close relationship, though they were formerly classed together. The only living Sirenians are the Dugong and the Manatee. Though ungainly creatures, popular fancy in ancient times regarded them as sirens, thence arose the name of the order, conferred, apparently, by Illiger the naturalist, to commemorate that flight of imagination. Their body is long, compact and cylindrical, without a dorsal fin, tapering towards the tail, which ends either in forked flukes or in a flat expansion, in either case set horizontally. Their fore limbs are well developed, flexible flippers. Their eyes are minute, ears are wanting, and their muzzle is bristly. Their skin is dark, tough, rough, sparsely hairy or somewhat smooth. The extant genera have teeth. The two mammae are on the breast, close to the arm-pits. Their brain is small, with few convolutions, and their dense, heavy bones are

the most solid among mammals. They are of slow habit and exceedingly inoffensive. Their food is wholly aquatic vegetation. Steller's Rhytina, the most whale-like in size and shape of tail, became extinct about 1770. Fossil forms have been found in deposits near Antwerp, in Pliocene beds in Bologna, in strata near Vienna, in West Indian Tertiary strata, and in the nummulitic Eocene of Egypt. They present problems of intense interest and, says Dr. James Murie, "notwithstanding that the Sirenia are aquatic and whale-like, their structural relationship with the Proboscidea [elephants] and Ungulata [horse, tapir, rhinoceros, pig, hippopotamus] is not so far-fetched as at first sight might seem. But the gap is not yet bridged, and until that is done the order Sirenia must be retained."

Sirens, in Greek mythology, sea-nymphs who by the beauty of their song lured the listener to destruction. They were apparently two or three in number, and, by the necessity of the case, haunted certain parts of the Mediterranean. Ulysses escaped their charm by getting himself bound to the mast of his ship and stuffing the ears of his crew with wax. They would have ruined the expedition of the Argonauts, but for the presence with the rovers of Orpheus, who, when they burst into song, also fell a-singing, and made music that eclipsed theirs. This involved their fate, for it had been decreed that they must die should any hearer deliberately prefer to listen to the music of another rather than to theirs. They accordingly threw themselves into the sea, and were changed into rocks. They are sometimes represented with the wings and the lower part of the body (or only the feet) of a bird.

Sirius, the brightest star in the sky, is more commonly known by the name of the Dog-star, since it occurs in the constellation known as Canis Major. Seen through a powerful telescope, Sirius is brilliantly white, and the light is so dazzling that the effect on the eye is as painful as that produced by directly gazing at the sun at noon. A small, darker star was discovered by Alvan Graham Clark, of New York, in 1862, and observed to revolve with Sirius about a common centre, the motion of each influencing that of the other. The motion of Sirius has been shown to be undulatory, the star moving on each side of a mean position. Since Sirius is so bright an object in the sky, it was, of course, known to the ancients, and became the object of many myths and superstitions, of which the tales of the Dog Days are survivals.

Sirocco. [Sirocco.]

Siskin, a book name for finches of the genus *Chrysomitris*, with eighteen species, from the Neotropical and Nearctic regions of Europe and Siberia. The Common Siskin, or Aberdevine (*C. spinus*), a British winter visitor, remaining to breed in parts of Scotland, is a common cage-bird, a little less than five inches long, with yellowish-green plumage, marked with black above; the under parts are white.

Sismondi, JEAN CHARLES LEONARD DE, whose real name was SIMONDE, historian and economist, was born at Geneva, Switzerland, on May 9th, 1773. Part of his youth was spent in England and in Italy; but he returned to Geneva in 1800, entered the Representative Chamber, and resisted ultra-democratic movements. His first volume, *Tableau de l'Agriculture Toscane*, appeared in 1801, and was followed in 1803 by his *Traité de la Richesse Commerciale*, based chiefly on Adam Smith. From 1807 to 1818 he was engaged on his great work, *Histoire des Républiques Italiennes du Moyen Age*, but found time for various other publications on economical and moral science, and for beginning his *Littérature du Midi de l'Europe* and his *Histoire des Français*, the latter of which he did not live to complete. He visited France in 1813, and his relations with two such opposite characters as Napoleon and Madame de Staël were somewhat remarkable, and did not tend to make him popular at home. He died at Geneva on June 25th, 1842.

Sisyphus, in Greek mythology, was the founder and king of Ephyra (Corinth), but a man of notorious cruelty, craftiness, and immorality, as a punishment for which he was condemned, after his death at the hands of Theseus, to roll eternally uphill a huge block of marble, which no sooner reached the top than it rolled down again.

Sittingbourne, a town of Kent, England, on a navigable creek of the Swale, 16 miles W. by N. of Canterbury. It is a borough of considerable antiquity, was a place of call for pilgrims on their way to Canterbury, and received from Elizabeth a charter of incorporation, and another by which it holds a weekly market and two fairs. It once had an oyster fishery, but its leading industries now are the making of paper, bricks, and cement. The most prominent buildings are the town hall, corn exchange, free library, Masonic hall, Foresters' hall, and St. Michael's Church. The last-named was nearly destroyed by fire in 1762. Amongst other curious entries, its register contains those of three marriages celebrated before Sir Michael Lovesey, one of the Members of Parliament who signed the death-warrant of Charles I. Pop. (1901), 8,943.

Siut, or ASSIUT, on the left bank of the Nile, the administrative capital of Upper Egypt, 210 miles S. of Cairo. It was known as Lycopolis to the Greeks, who mistook the jackal for the wolf. It is one of the few Egyptian towns that has kept its ancient name almost unaltered. Plotinus (A.D. 205-270), the Neo-Platonic philosopher, was a native, but perhaps the most interesting of its former inhabitants was the hermit, John of Lycopolis, who dwelt in a cave in the necropolis in the latter half of the 4th century, and who is said to have predicted the victory of Theodosius over Eugenius at Aquileia, near the head of the Adriatic Sea, in 394. The ancient rock tombs in the necropolis contain many curious relics, and the view of the Nile

valley from the cemetery heights is unsurpassed in Egypt. Siut is famous for its beautiful red and black pottery, especially bottles and pipe-bowls, and it has also manufactures of linen and embroidered leather goods, and exports ostrich feathers, natron, soda, and corn. Pop. (1900), 42,087.

Siva, or SHIVA, the third person in the Hindu Trinity [BRAHMA, VISHNU], representing the destructive power of the universe as opposed to the creative and vivifying forces. The worship of Siva is by some believed to have been a later addition to pure Brahminism, only appearing in the Puranas and Tantras, and associated with the gloomier aspect of the faith, involving cruel and mysterious rites. Durga or Devi, his consort, is especially propitiated by self-inflicted torture. Gradually, however, Siva, growing more popular, supplanted Vishnu as the latter had supplanted Brahma, and was credited with the beneficent qualities of his partners in divinity. The destroyer thus only exercises his power with a view to renewal of life, and the patron of hideous sacrifice becomes the teacher of ascetic virtue. He is represented with five heads and three eyes, a crescent on his brow, his hair drawn to a horn-shaped peak and entwined with the folds of the Ganges. He rides on the bull Nandi, wears a necklet of skulls, and carries a trident of human bones. His home is on Kailasa, a remote Himalayan summit. Among his other names are Kala ("black"), Mahadeva ("Great God"), and Maheshwara ("Great Lord").

Siwalik Hills, a mountain range in the north of the North-Western Provinces and the north-east of the Punjab, India. It runs parallel with the Himalaya in a generally north-westerly direction from Hardwar, on the Ganges, to the basin of the Beas, having a total length of 200 miles, an average breadth of 10 miles, and its highest peaks reaching an altitude of 3,500 feet. It is pierced by the Ganges, Jumna, Sutlej, and Beas. Its sides are clothed with trees, the higher points with pines, and the fauna includes the elephant, tiger, sloth-bear, leopard, hyæna, spotted deer, hog, and monkeys. The principal pass, that of Mohan, in Dehra Dun, carries the road from Saharanpur to Dehra and Mussooree. Geologically, it belongs to the Tertiary deposits of the outer Himalaya, and its palæontology is of exceptional interest, owing to the prevalence of fossil remains of large vertebrates, especially mammals. The most remarkable are those of sivatherium, a huge ruminant, greater than the rhinoceros, and of various quadrumana whose occurrence in the Tertiary was first ascertained from these hills.

Six Nations. [IROQUOIS.]

Sixtus, the name by which five Popes have been known in history. SIXTUS I. was Bishop of Rome from about 119 to 126, and is conjectured to have been martyred. SIXTUS II. became Bishop in 257, and suffered martyrdom in

the following year. He restored relations with the African and Eastern Churches, which had been suspended on the subject of the baptism of heretics. SIXTUS III. was Bishop from 432 to 440. SIXTUS IV. (FRANCESCO DELLA ROVERE) was born near Savona on July 21st, 1414. He became Cardinal in 1467, and on August 9th, 1471, was elected Pope. In private life he was blameless and hospitable, but he was the first pontiff to sanction nepotism and the enrichment of his relatives. He was a munificent patron of letters and art, established the first Foundling Hospital in Rome, built the Sixtine Chapel and Bridge, and was the second founder of the Vatican Library. His politics were unstable, save in respect of the resistance which he always showed to the Turks, but his efforts to set the secular princes of Italy by the ears were both discreditable and unsuccessful. Vexation at the defeat of these sinister plans is said to have hastened his death, which took place on August 13th, 1484. SIXTUS V. (FELICE PERETTI) was born at Grottammare on December 13th, 1521. He entered a Franciscan monastery as a servant, educated himself diligently, was admitted to orders under the pseudonym of Montalto, obtained the red hat in 1570, and succeeded to the chair of St. Peter on April 24th, 1585. His reign was marked by great vigour. He embellished Rome with fine buildings, beginning the dome of St. Peter's, enlarging the Vatican Library, and constructing a great aqueduct. He excommunicated Elizabeth of England and Henry of Navarre, and, dying on August 27th, 1590, left an enormous fortune to the Holy See.

Sizar, an undergraduate of Cambridge University and Trinity College, Dublin, who, in consequence of his poverty, received free commons (*size*, being a fixed allowance of food and drink) and paid a nominal sum for lodgings. Formerly they were required to render certain menial services in return, but these have long since lapsed. "They swept the court," writes Lord Macaulay; "they carried up the dinner to the Fellows' table, and changed the plates and poured out the ale of the rulers of the society."

Skager-Rack, or THE SLEEV, an arm connecting the North Sea with the Cattegat, and separating Denmark from Norway. It is about 150 miles long, with an average breadth of 80 miles, and is remarkable for strong and dangerous currents.

Skate, a popular name for those fish of the Ray genus in which the snout is long and pointed. The True Skate (*Raja batis*) is very common round the British coast. Sometimes it reaches to enormous proportions. A stuffed specimen in the Natural History Museum, South Kensington, measured six and a half feet long by five feet and a half broad. It is recorded that a specimen weighing 200 pounds was once served at dinner at St. John's College, Cambridge, and sufficed for a company numbering 120 persons.

When caught on the hook it cannot be raised if the fish lie still and keep its head down; let it, however, but raise its head, and it will rise through the water like a kite in the air. It is a somewhat omnivorous and voracious feeder. From the dusky grey or mottled colour of the upper part of the body, it is in some parts of Scotland known as the Grey Skate and in others as the Blue Skate. It is often infested with the fish leech, *Hirudo muricata*. The Long-nosed Skate (*R. vomer*), found in the northern waters of Europe, has the snout prolonged to a sharp point far in advance of the mouth, is four feet and a half long by a little more than three feet wide, the tail measuring sixteen inches, and is of a leaden colour. The Bordered Ray (*R. marginata*) has the anterior outlines of the body deeply undulated. It is no fewer than eight feet long by eight feet broad, is grey above and white beneath, and in great demand in France as an article of food during Lent. The Shagreen Ray (*R. fullonica*) derives its name from the circumstance that its body is covered with minute spines, both above and below. It is about two feet eight inches long by fourteen inches broad. It occurs off the British coasts, but is not much sought after for food. Other British species are the Home-lyn, or Spotted, or Painted Ray (*R. maculata*), the Sandy Ray (*R. circularis*), and the Thorn-back.

Skating, a mode of locomotion over ice, real or artificial, by means of steel blades, or runners, secured to the soles of the boots. It has been in vogue among all northern peoples for several centuries, but is practised especially in the United Kingdom, Scandinavia, Holland, Germany, Austria, Switzerland, France, and Belgium, in the Old World, and in Canada and the northern States of the American Union in the New World. The older-fashioned skate, with wooden frame, which was screwed to the heel of the wearer's boot, and then fastened by straps, has to a great extent been replaced by all-metal skates, which are capable of immediate adjustment to and release from the foot. There are two methods of skating, the distance and figure. For the former, skates with blades of considerable length are generally employed, for the latter, the skate is of much the same length as the boot, and should not be larger. In order to render a popular and healthy exercise independent of climatic conditions, skating rinks (formerly known as *glaciaria*) with artificially-frozen ice have been introduced in several large towns. Prince's Skating Rink in Knights-bridge, London, and Niagara Hall, Westminster, are two of the most familiar. Owing to the costliness of such undertakings, however, they are reserved for the well-to-do. The chief legislative and administrative bodies for skating, regarded seriously as a sport, are the London Skating Club, founded in 1830, which performs on private water in Regent's Park and is solely concerned with figure-skating, and the Edinburgh Skating Club, founded in 1642, the oldest

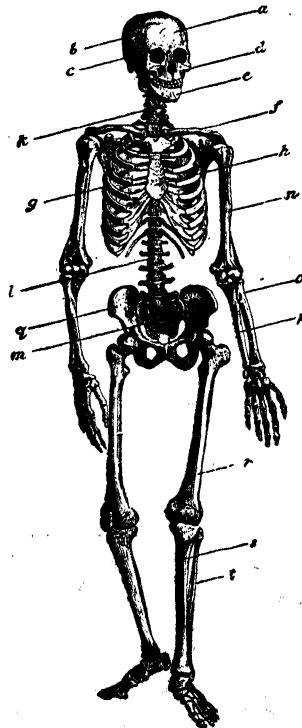
society in the United Kingdom. The National Skating Association, established in 1879, while not neglecting figure-skating, is largely interested in distance-skating, and is a member of the International Skating Union. Its matches usually are held in the English Fen district. Amongst recorded times for racing, in 1887 T. Donoghue skated one mile straight, with the wind, on the Hudson River, in New York State, in 2 minutes 12 3-5 seconds, and J. Nilsson, at Montreal, in 1897, skated a mile in 2 minutes 41 1-3 seconds. "Fish" Smart, the English champion, skated a mile in 3 minutes, with no wind, but a flying start. Roller-skating was introduced about 1865 to provide recreation of a quasi-skate-like description for asphalt and other smooth surfaces. In this exercise the skates are furnished with one pair of wheels fore and another pair aft. By the introduction of the ball-bearing type of skate, about thirty years later, fresh impetus was given to the pastime. In Norway the skate finds a rival, though not on a wide scale, in the ski, which Dr. Fridtjof Nansen, in his *First Crossing of Greenland*, defines as a long, narrow strip or runner of tough wood, from 3 to 4 inches broad and 8 feet or so in length, 1 inch thick at the centre under the foot, and bevelled off to about a quarter of an inch at each end. In front it is curved upwards and pointed, and is sometimes turned up a little at the back, too. It is, of course, for use on the snow. A race of 12 miles can be accomplished in an hour and three-quarters, and in jumping competitions a candidate for honours made a clean jump on a pair of ski of 103½ feet. But such competitions are dangerous and foolhardy. Besides dancing on the ice, hockey is a game which is admirably adapted for skaters. On the lakes of Canada and the United States, when they are frozen over for many miles, a modification of the skate principle has been successfully applied to a framework of yacht-like shape, equipped with masts and sails, and mounted on large runners of metal. By the use of such "boats" ice-yachting has become a standard recreation on the part of those who view sailing with special favour.

Skeat, WALTER WILLIAM, philologist, was born in London on November 21st, 1835, and was educated at King's College School, Highgate School, and Christ's College, Cambridge. Taking holy orders, he was curate at East Dereham in 1860 and at Godalming in 1862. Two years later he was lecturer in mathematics at his college. He had already turned his attention to the study of English philology, and edited between 1865 and 1872 many specimens of early literature for the English Text Society. He was also employed to continue Kemble's Anglo-Saxon Gospels for the Cambridge Press, and to edit parts of Chaucer for the Oxford Press. In 1873, he founded the English Dialect Society, and in 1878 was appointed Elrington and Bosworth Professor of Anglo-Saxon at Cambridge. His *Etymological Dictionary of the English*

Language, published in 1881, and his edition of Chaucer, are invaluable, but his marvellous energy and industry have left scarcely any branch of Old English literature and dialect undelved. He is a member of the British Academy, whose number is limited to 100.

Skegness, a watering-place on the coast of Lincolnshire, England, 20 miles N.E. of Boston. John Leland, the antiquary, who flourished during the first half of the 16th century, says that remains of buildings were visible at low water, from which it was inferred that an earlier town had been overwhelmed by the sea. It is now in good repute for its bracing climate, and is largely resorted to in midsummer as a holiday resort owing to its long stretch of firm broad sands and its excellent bathing. There are marine and pleasure gardens on the front, and the place is in vogue with volunteer regiments for the facilities which it affords for encampment. A mirage may often be seen on the sea in certain states of the atmosphere in calm weather, and the display of phosphorescence is at times beautiful. Pop. (1901), 2,140, greatly increased in the season.

Skeleton. The human skeleton consists of some 200 bones, though the number of separate bones varies at different times of life, bones



SKELTON OF MAN.

which are distinct in early life becoming fused in old age. The vertebral column is made up in adult life of 26 separate bones, and is divided into a cervical portion (see Fig., *k*), a dorsal portion, to which the ribs are attached, a lumbar portion (see Fig., *l*), the sacrum (see Fig., *m*), and the coccyx. The sacrum originally consisted of five, and the coccyx of four, distinct vertebrae. The nine vertebral, together with the five lumbar vertebrae, the twelve dorsal vertebrae, and the seven cervical vertebrae make up a total of 33 vertebrae; or, taking account of the fusion of originally separate vertebrae already alluded to, the total of 26 separate bones in the entire vertebral column is accounted for. Poised on the summit of this column is the skull. In the Figure the letter *a* denotes the position of the frontal bones, which form the anterior wall of the cranial vault; *b* indicates the situation of the laterally-placed parietal bone, and *c* of the temporal bone, which lies beneath each parietal bone; *d* indicates the superior maxillary bone, and *e* the inferior maxillary bone. The shoulder girdle is made up of the clavicle or collar bone (see Fig., *f*), and the scapula, or shoulder-blade on either side. The clavicle articulates with the scapula, and the articulation of the rounded head of the humerus with the glenoid cavity of the scapula constitutes the shoulder joint. The ribs, 12 in number on each side (see Fig., *g*), make up the bony framework of the thorax, and, with the exception of the lowermost floating ribs, they are united to the sternum (see Fig., *h*) by the several costal cartilages. The bones of each upper extremity are 64 in number; in the upper arm is the humerus (see Fig., *n*), in the fore-arm are the radius (see Fig., *o*) and the ulna (see Fig., *p*); and then follow the bones of the carpus and metacarpus, and the phalanges. The hip girdle is formed by the pelvis (see Fig., *q*), and the hip-joint on either side is constituted by the articulation of the head of the femur with the acetabulum, the cavity which exists on each of the lateral aspects of the pelvis. Each lower extremity contains in all 62 bones. The thigh-bone is called the femur (see Fig., *r*); the bones of the leg are the tibia (see Fig., *s*) and the fibula (see Fig., *t*); and then follow the bones of the tarsus, the metatarsus, and the phalanges.

Skelligs, THE, two rocks, about 8 miles W. of Bolus Head, County Kerry, Ireland. On the summit of the larger, called the Great Skellig, 714 feet above the level of the sea, stand the ruins of St. Pinnian's Monastery and the station of St. Michael, to which devotees make a pilgrimage every year to discharge a difficult penance. Part of this consists in ascending the lofty rock known as St. Michael's Pillar. The Skelligs are a breeding-place of the gannet.

Skelmersdale, a town of Lancashire, England, 4 miles E.S.E. of Ormskirk. Coal-mining and brick-making are the leading industries. The town gives the title of Baron to the Bootle-Wilbraham family. Pop. (1901), 5,699.

Skelton, JOHN, poet, was born in Norfolk England, about 1460, showed remarkable promise as a scholar, won the patronage of Margaret Tudor, the learned mother of Henry VII., and was appointed tutor to Henry VIII. About 1500 he took orders, and held till his death the living of Diss in Norfolk. His first poem was on the death of Edward IV. in 1483, but his genius lay in the direction of boisterous satire, ribald merrymaking, and Rabelaisian wit. In *Colin Clout* he assails the Church unsparingly, and in *Why come ye not to Court?* he makes Cardinal Wolsey, then in the zenith of power, the butt of fearless ridicule. The *Bowge [Barge] of Court* deals with the follies of the day in a less personal form, whilst *The Book of Philip Sparrow* shows his lighter moods in a pleasant shape. It is said that Wolsey's wrath compelled him to seek sanctuary at Westminster, where he died on June 21st, 1529, and was buried in St. Margaret's.

Skene, WILLIAM FORBES, historian and Celtic scholar, was born at Inverie Knoydart, Inverness-shire, Scotland, on June 7th, 1809, and educated at the Royal High School of Edinburgh (where he taught himself Gaelic), Hanau, near Frankfurt, and St. Andrews University. He studied for the law, became a writer to the signet in 1832 and was soon afterwards appointed clerk of the bills in the bill chamber of the Court of Session, a post which he filled till 1865. His love of Gaelic lore and knowledge of the Highlands was turned to account in his book on *The Highlanders of Scotland* (1837). He published nothing for a quarter of a century, but in 1862 appeared his valuable introduction and notes to the *Book of the Dean of Lismore*, a collection of Gaelic poetry edited by the Rev. Dr. T. McLachlan. This was followed by *The Chronicles of the Picts and Scots* (1867), *The Four Ancient Books of Wales* (1868), *Essay on the Coronation Stone of Scone* (1869), editions of John of Fordun's *Scotichronicon*, the *Liber Pluscardensis*, and (somewhat condensed) Adamnan's *Life of St. Columba*. These researches led up to his principal work *Celtic Scotland: a History of Ancient Alban* (1876-80), in which he dealt with the history and ethnology, the church and the culture, the land and the people. On the death of John Hill Burton in 1881, he was appointed Historiographer Royal for Scotland. He died at Edinburgh on August 29th, 1892.

Skerries, a seaport of County Dublin, Ireland, 4 miles S.E. of Balbriggan. It has manufactures of embroidered muslin, but the fisheries are an important industry. The harbour is good, the roadstead being safe in southerly winds, and there is a pier. The strand is resorted to for sea-bathing. The town is situated in the parish of Holmpatrick, which derives its name from St. Patrick's Isle, a mile from the shore, said to have been the place where the Saint first landed and preached in Ireland. The quarries furnish an excellent building stone, which is largely exported. Hacketstown House

lies in beautiful grounds skirting the shore and Milverton, finely situated, commands views of picturesque and lovely scenery. Pop. (1901), 1,721

Skerryvore, a reef of submerged rocks and islets of the Inner Hebrides, Argyllshire, Scotland, about 12 miles S.W. of the island of Tiree. Owing to the dangers to navigation, a lighthouse was erected in 1838, after the designs of Alan Stevenson (1807-65), the novelist's uncle. The building operations began in 1838 and were completed in 1844. The tower is 138 feet high (155 feet to the top of the lantern), 42 feet in diameter at the base, gradually decreasing to 16 feet at the top, and is constructed throughout of granite, the first 26 feet from the rock being monolithic or solid. As they spring from the solid, the walls are $9\frac{1}{2}$ feet thick, gradually diminishing to 2 feet. The interior is divided into ten storeys, including the light-room, each floor being 12 feet in diameter. The optical apparatus is dioptric revolving, and the light is visible for 21 miles. The total cost of the lighthouse, including the small harbour, was £87,000. It is said to be "the finest example for mass, combined with elegance of outline, of any extant rock tower." Robert Louis Stevenson called his house at Bournemouth "Skerryvore," and said that the family were proud of Alan Stevenson's achievements in the building of lighthouses, which were their "pyramids and monuments."

SKI. [SKATING.]

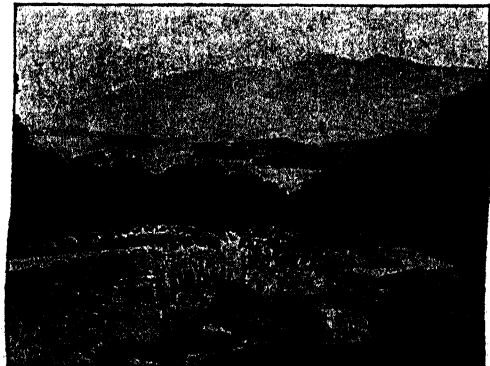
Skibbereen, a town in the south-west of County Cork, Ireland, on the Ilen, 13 miles S.S.E. of Bantry. It is a somewhat important distributing centre and also a considerable fishing port. The fishing school at Baltimore, on the coast, about six miles to the south-west, was founded by the Baroness Burdett-Coutts and Father Davis. The great famine of 1847 made itself severely felt in Skibbereen and the district. Pop. (1901), 3,208.

Skiddaw, a mountain in Mid Cumberland, England, $3\frac{1}{2}$ miles N. of Keswick, from which it is usually ascended. It is situated a short distance to the east of Bassenthwaite Water, and is an oblong mass some 8 miles in length by 7 miles in width. Within this area are embraced Caldbeck Fells in the north, Saddleback or Blencathra (2,847 feet) in the east, and the bleak moorland tract of Skiddaw Forest in the centre. The mountain culminates in seven peaks, of which the highest is 3,054 feet above the level of the sea and commands a grand view of the Lake District.

Skimmer, a bird belonging to the genus *Rhynchops*, of the Gull family, with two species from the Old World and one from the New. The bill is long and thin, and, the lower mandible being the longer, the upper serves to scoop up small fishes as the birds skim along the surface of the water. It is from this action that the bird derives its popular name.

Skin. The skin consists of a vascular layer called the corium, or true skin, and of the epidermis. The corium presents innumerable raised conical elevations, known as papillæ, which contain the various nerve terminations concerned with the sense of touch. The skin also contains glands, and these are of two kinds: the sudoriferous or sweat glands, and the sebaceous glands. The skin is, moreover, beset with hair follicles, which attain a remarkable development in certain parts, more particularly in the hairy scalp, and it is in connection with hairs that the sebaceous glands for the most part occur. In certain parts the structure of the skin is modified, notably so in the nails of the fingers and toes. The skin serves to protect internal parts from injury; it is the organ that is concerned with tactile sensation, and is, moreover, an excretory organ. The skin undoubtedly possesses the power of absorbing substances which are rubbed into it; and the action of certain drugs upon the system is brought about sometimes by the method of inunction. There has been some difference of opinion as to the extent to which liquids brought in contact with the body are absorbed by the skin; such absorption probably occurs, though it is much less marked in man than in some of the lower animals. Finally it may be noted that the skin plays an important part in the regulation of the temperature of the body.

Skin, CONSIDERED AS A RACE-TEST. Though the most patent and most striking of all the physical criteria of races, the colour of the human skin is admitted by most ethnologists to be one of the least trustworthy of racial tests. The great sub-divisions of the human family—divisions which are indubitably proved by such unerring tests as cranial measurements, by the microscopic examination of the sections of hair, by arm-reach and so on to form themselves into



DERWENTWATER AND SKIDDAW FROM ASHNESS BRIDGE.

(Photo: Abramham, Keswick.)

a smaller family, or representative race of mankind—exhibit very often the extremes of colouration. Take, for instance, the Caucasian race. The most recent research goes to prove that this

division of mankind, often erroneously termed Aryan (a word which has a philological not an ethnological value), includes such diverse races as the Swedes and Danes, with their flaxen hair and blue eyes, the dark peoples of the Pyrenees and Andalusia, the dazzlingly white-skinned Circassians and the Kabyle Berbers of Northern Africa, who are often a chocolate-brown. Thus the colour of the skin must be regarded as a very unsatisfactory race-test by any but the most superficial observers. Physiology teaches us that the colour is a consequence of climate and even diet. The pigment or colouring matter in a rudimentary state is common to all races. It lies under the epidermis or rather under the second or Malpighian skin, and its development is encouraged by certain physiological conditions superinduced by climatic and other surroundings. The fairest North German, given the right environment, would have descendants who in a few generations might be of a Negro black. The anthropologist, Theodor Waitz, has laboured to prove that colour is not due to sunshine alone, but to heat combined with moisture and an excess of vegetable food, producing in the body by natural chemistry more carbon than can be assimilated. In support of this he gives examples to show "that hot and damp countries favour the darkening of the skin, and that the same race inclines to be darker in low marshy districts than on uplands or in mountainous districts." Lepsius, the Egyptologist, declares that the more tropical the climate the blacker the skin, and he acutely demonstrates that if the line of equatorial heat is followed from Africa into Asia, it is around it in the latter Continent that the darkest of the Eastern races are met with. To this general theory exceptions can be found, but usually peculiar local circumstances are discoverable which throw light on what would seem otherwise to constitute a breach of the law. Thus G. A. Schweinfurth, in his book *The Heart of Africa*, ingeniously explains the reddish hue of the Bongos and others of the tribes dwelling in the hot, moist White Nile districts as due to the soil of that neighbourhood being loaded with iron. A striking corroboration of the theory is furnished by the New World. There in the vast stretch of land from the Arctic to the Antarctic Seas we have a continent inhabited by a race to which the best authorities to-day are inclined to assign a place as a specific homogeneous division of mankind, and yet showing every variation of colour from the sallow Eskimo and the dirty buff of the Chukchi to the almost European tint of the Patagonians, while between the two on the Equatorial line we have the really dark American Indian races, the still savage peoples of Brazil and the Amazon valley. But the tint of the skin is influenced by the thickness of the latter as well as by climate. Thus all Negroes have the sole of the foot and the palm of the hands less dark than the rest of the body. The variations in the cutaneous colouration depend on the number of pigmentary cells contained in

a given space. Thus the colour on the lateral face of a Negro's fingers, notwithstanding the delicacy of the epidermis in that part, is nearly as light as on the palms of the hands, because in these portions of the finger the pigmentary cells are rarer than nearly anywhere else. In the coloured races the back of the body is always darkest. Numerous observations go to show that the skins of coloured races are always of a lighter tint in the newly-born than in the adult. The tint of the newly-born Negro baby is not white, as has been sometimes said, but a greyish-red, a blacker ring being noticeable around the navel and a darker tint on the generative organs. From the eighth day, sometimes as early as the third, the whole body colour has usually become as dark as in the adults. Sunlight does not appear to have any influence on the production of this phenomenon, for in many savage tribes the newly-born infant is kept in his mother's hut for some weeks after birth. Some scientific authorities believe it to be very closely connected with the respiratory functions, but it is undoubtedly due ultimately to that mysterious force, heredity. The effects of the air, i.e., the action of the atmosphere, of heat and light, on the bare portions of the skin vary much in different races. It is among the races with moderate pigmentation, such as the brown races of Europe and the yellow races of Asia, that the effects are most noticeable. But if the colour of the human skin can never be regarded by the scientific inquirer as a trustworthy racial criterion, it has long served as a very useful work-a-day basis for dividing mankind into the three or four fundamental types which are regarded as representatives of the great family groups of humanity. Thus we have the white or Caucasian race, the yellow or Mongolic race, the black or Negro race, and lastly, if the natives of the New World are to be regarded, as the latest research seems to make necessary, as a separate human family, the red or American race. The first of these four predominate in Europe, in Africa north of the Sahara, in Persia, Arabia, Palestine and Asia Minor. The second are overwhelmingly typical of Asia and the Far East. The third, the immense Negroid family, has Africa to itself, south of the Sahara, including on that continent such variant types as the forest dwarfs of Equatorial Africa, the Bushmen, Hottentots and the Bantu negroes of Cape Colony, and, outside the limits of Africa, claiming kinsmen among the Andaman Islanders, the aboriginal races of the Malay Peninsula (the Semangs and the Sakais) and the varied black races of the Eastern Archipelago and of that portion of the South Sea Islands commonly termed Melanesia, New Guinea, New Caledonia, the New Hebrides, with all their Papuan inhabitants, and probably the now extinct Tasmanians. The fourth or American race is confined to the New World, and, though in the broadest anatomical and physical sense exhibiting a specific unity, affords examples of every type of complexion.

variety of stature and physical characteristics. Thus the colour law is in no sense coterminous with the geographical habitat of each human family. Just as in Bolivia in South America the coppery-hued Maropas, the brown-black Aymaras, the yellowish Moxos, and the light-complexioned Guarayos live as neighbours, so in the South Seas the yellow-brown Malay was for centuries the neighbour of the sooty-black Tasmanian. As to the American race being termed "red," no greater error in ethnological nomenclature has ever gained popular currency. It cannot be too emphatically stated that there is no American aboriginal race which is red-skinned, though the natural coppery cinnamon hue of many of the North American tribes emphasized by the tribal habits of daubing their faces with red ochre afforded some excuse for the ludicrous misnomer given them by the first white settlers. No skin of any race of man has ever been met with meriting the epithet red. As has been said, in the vast stretch of North and South America, almost every tint of the human skin is met with. On the Brazil coast the fisher Indian tribes there, on coming into the towns and meeting the Chinese sailors who manned the ships trading with the Brazilian ports, instantly claimed them as kinsmen, and observers at the time declared that the tint of the two races when side by side was indistinguishable. Then there are the brown, olive, and even black Charruas and wild Californian tribes; and elsewhere the cinnamon tint, more or less intense, blends with a yellow or black, giving respectively a hue comparable to a bright copper, such as is exhibited by certain races of South, West, and Central Africa. The actual texture of the human skin is again of little or no value as a racial test. The Negro, who is admittedly the lowest type of humanity, has in almost all cases a skin which travellers agree in describing as "velvety" to the touch, and this silkiness is practically unmatched in any of the superior races. The Malay, who is intellectually as far in advance of the Negro as the European races are in advance of the Eskimo, has a uniformly coarse skin. Such, again, is the case in the true Mongol, while the American aborigines throughout nearly the whole of that continent have roughish skins. The variations in Europe are endless; but while the Turkish, Georgian, Circassian and other peoples of the Caucasus and Asia Minor are renowned for the softness of their skins, none of them approaches the Negro in this respect, with whom it has long been acknowledged as a physical characteristic. There is a great difference in the degree to which the skins of races tan or blacken from exposure to the sun. Thus the darker European peoples brown uniformly to a tint almost resembling a mulatto colour. In the blond races of Europe the sun reddens the skin. Under the action of a tropical sun the skin usually passes from a rosy white to a brick-red or becomes covered with the red spots known as freckles. Given favourable circumstances, even Englishmen may attain,

under free exposure to tropical sunlight, a tint which unless seen is scarcely credible. Dr. J. Beddoe, the greatest British authority on race-colours, made observations in North Queensland, "a fairly healthy country for Europeans, where the air is clear and dry and the sun is extremely powerful, but exposure to it is not shunned as it is in most hot countries." There on the ranches Dr. Beddoe saw Englishmen whose faces, arms, and necks were burnt as dark a colour as some of the lightest Gujarati Indians of British India. Of course, the colour so acquired is only temporary. It diminishes in winter and disappears entirely on a return to a temperate climate. The yellow races tan various shades. For instance, in the case of the Indo-Chinese and Malays, the skin becomes a black-olive. The skin of the Chinese proper, curiously enough, tends to become darker in winter and paler in summer. Among the dark peoples of the South Seas variations in the sun-effect are very decided. Thus Melanesians from Fiji and New Caledonia, naturally of a lightish red or orange colour, were observed by Dr. Beddoe to burn almost a black of a tint darker than the average Australian "black-fellow." The people of the New Hebrides are darker than those of Eastern New Guinea and the neighbouring islands, yet they do not tan to the blackest hue as do the latter. Among certain peoples whose skin is naturally dark the parts exposed to the air are often lighter than the parts protected by clothes. This is said to be the case among the Fuegians and the Sandwich Islanders. The Fuegians take on a tint which is a brick-brown or a sombre red. The Gujarati lascars and the so-called Portuguese of Goa assume from exposure a "burnt-in" tint which rivals the natural colour of the darkest Papuans of New Guinea and the New Hebrides. Thus it is seen that it is by no means the darkest individuals or races which burn to the blackest hue by exposure.

Skink, a popular name for *Scincus officinalis*, an African lizard from six to eight inches long, reddish-dun in colour, marked with transverse dark bands. It likes warmth, frequenting the little hillocks of fine light sand at the foot of the hedges bordering cultivated lands. There it may be seen basking in the rays of the burning sun, chasing every now and then such beetles as come within its range. It runs quickly and, when threatened, buries itself rapidly in the sand. Among the ancient Greeks and Romans it had a bad time, since it found favour in the eyes of their physicians, who dried and powdered its flesh and prescribed it for nearly every malady. It was not till the 16th century that the superstitious belief in its efficacy disappeared. The name is also used for any member of the family Scincidae, in some of which the limbs are rudimentary, and in others altogether absent. They are quite harmless and prey on worms and insects.

Skinner, JOHN, song-writer, was born on October 3rd, 1721, in the parish of Birse,

Aberdeenshire, of which his father, John Skinner, was schoolmaster. He graduated at Marischal College, Aberdeen, and afterwards taught in the parish schools of Kemnay and Monymusk, where he left Presbyterianism for the Episcopal Church. He was ordained in 1742 and appointed minister of Longside, Aberdeenshire, where he officiated for sixty-four years. In common with other Episcopal clergy he suffered through the restrictions imposed after 1745. His church was destroyed, his house pillaged, and, in 1753, he was imprisoned for six months for preaching to more than four persons. Besides the study of theology and ecclesiastical history, his facility in verse-making resulted in the production of many lyrics, some of which attained a wide popularity. Skinner regarded them merely as diversions, but Robert Burns esteemed them highly, an opinion which still prevails, holding the lively "Tullochgorum," a protest against political extremes, "the best Scotch song ever Scotland saw." His other famous songs are "The Monymusk Christmas Ba'ing," "The Marquis of Huntly's Reel," "Lizzie Liberty," "The Old Man's Song," and "The Ewie wi' the Crookit Horn." In 1746 he wrote *A Preservative against Presbytery* and his *Ecclesiastical History of Scotland*, published in 1788, deals with special fulness with the post-Reformation period. His wife died in 1799. In 1807 he resigned his charge and went to live with his son, the Bishop of Aberdeen, in whose house he died, twelve days later, on June 16th.

Skinner, JOHN, Primus of Scotland, second son of the foregoing, was born at Longside, Aberdeenshire, on May 17th, 1744, and as a boy shared his father's imprisonment in 1753. Graduating at Marischal College, Aberdeen, in 1761, he became a private tutor, and when only nineteen was ordained and placed in charge of Ellon, at a stipend of £25 a year. He succeeded to the charge of the congregation in Longacre, Aberdeen, in 1775, and further accommodation being required, the two upper floors of his dwelling were fitted up as a chapel to hold five hundred people. Skinner was consecrated as coadjutor to the Bishop of Aberdeen on September 25th, 1782; was appointed bishop of the diocese in 1787, and elected primus in 1788. On August 31st, 1784, he assisted in the consecration of Samuel Seabury, first Bishop of Connecticut. He took a leading part in the removal of the penal laws, which was effected by the passing of the Relief Act of 1792, and on July 13th, 1816, he died, being buried in the Spital Churchyard in Aberdeen.

Skipton, a town of the West Riding of Yorkshire, England, 9 miles N.W. of Keighley, situated on a branch of the Aire. The principal buildings include the Perpendicular church of Holy Trinity, the chancel screen of which was transferred from Bolton Abbey in 1533, the Mechanics' Institute and the Grammar School, founded in 1548. The leading industries are the spinning of cotton and thread and the weaving of cotton and worsted, in

addition to limestone-quarrying in the vicinity. Skipton was the capital of the old district of Craven and at the Conquest was granted to William de Romillé, who built the castle as the seat of his barony. In the 14th century it passed to the Cliffords, who have since held it. Of the original stronghold the sole relic is the western doorway to the inner castle. Next to this the oldest extant portion are the seven round towers, partly in the sides and partly in the angles of the present spacious structure. It was besieged by the Roundheads during the Civil War and partially demolished and dismantled in 1649. At a later date it was restored and rendered habitable by the Countess of Pembroke. The castle is said to have been the birthplace of Fair Rosamond, daughter of Walter de Clifford and mistress of Henry II. Pop. (1901), 11,986.

Skirret (*Sium Sisarum*), an umbelliferous plant, native to China, which has been cultivated in England as a vegetable since 1548, but is now little known. The roots, which form the edible portion of the plant, are fasciculate tubercles, and are eaten, boiled, with butter.

Skittles, a game of skill which was usually played in alleys, most if not all of which have been established in public-houses and country inns. This association has had a detrimental effect on the character of the game, which has come to be regarded as vulgar, or as reserved for the humbler classes. Henry Mayhew (1812-1887), in his *London Labour and London Poor*, declared that costermongers considered themselves amongst the best players. Charles S. Calverley's contention that with some "life is all beer and skittles," goes to show that this pastime is placed on a high level by those who follow it. The theory of the game is quite simple. At one end of the alley nine large pins of hard wood, having the appearance of the projectiles used in big guns, are set up on end in rows of three, there being a considerable space between each pin, in a lozenge or diamond shape, so that an angle and not a side shall always be presented to the player. The thrower is armed with a great cheese-shaped disc or "ball," varying in weight from 7 to 14 pounds, which he causes to trundle down the alley towards the pins, his object being to "floor" them in the smallest number of casts. As it is possible to knock down all nine in one blow, it will be seen that some scope for science is presented by this apparently easy game.

Skobelev, MICHAEL DIMITRIEVITCH, Russian general, was born near Moscow on September 29th, 1843, and was educated at Paris and the Military Academy in St. Petersburg. At the age of twenty he was engaged in repressing a rising in Poland. In 1868 he was sent on the staff to Turkestan, and he led the van of Lomakine's army to Khokand in 1873, reducing the province and becoming its governor in 1876 with the rank of major-general. On the outbreak of the Russo-Turkish War he joined the

staff of the Grand Duke Nicholas, and did brilliant service at Plevna and Adrianople. In 1880 he was once more in Central Asia, capturing Geok Tepe (January 12th, 1881) and playing havoc with the Tekke Turcomans. Recalled by the Tsar, he took the opportunity during a visit to Paris in January, 1882, to make a violent Pan Slavist speech, threatening Germany with war. He was summoned back to St. Petersburg, and five months later died suddenly at Moscow on June 25th, 1882.

Skua. [GULL.]

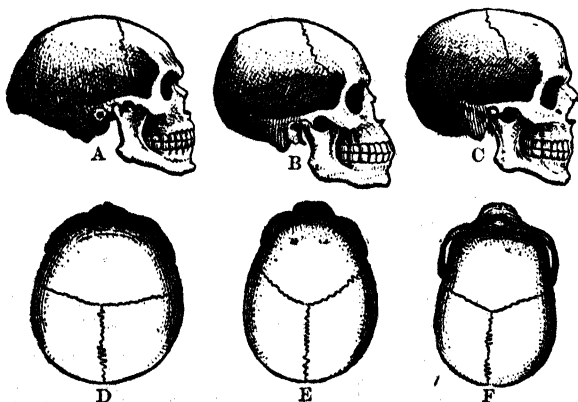
Skull. The skull consists of twenty-two separate bones, eight of these forming the cranium, and the remainder entering into the constitution of the face. Below and at the back part of the skull is situated the occipital bone. In front of this, and entering into the formation of the basal part of the skull, are the sphenoid and the ethmoid bones; the lateral aspects of the cranial vault are formed by the two parietal bones, and in front of these are the two frontal bones. The temporal bone of either side lies below the parietal and in front of the occipital bone, its anterior margin articulating with a portion of the sphenoid bone. The fourteen bones of the face consist of the pairs of nasal, superior maxillary, lachrymal, palatine, inferior turbinated, and malar bones, with the single vomer and the inferior maxillary bone. The bones of the cranial vault are closely

magnum in the occipital bone, and through it passes the medulla oblongata which connects the brain with the spinal cord. The spaces which remain unossified at birth, in the middle line of the skull at the anterior and posterior extremities of the sagittal suture, are called the fontanelles; the anterior fontanelle is not completely closed by bony growth until the first or second year after birth. The posterior fontanelle is closed within a few months of birth. There are also two lateral fontanelles situated at the anterior and lower angles of the parietal bones; these, however, become completely ossified very shortly after birth. The skulls of different racial types present distinct peculiarities, which have been made to serve as a basis of classification. The brachycephalic skull is a skull whose breadth is great in proportion to its length, and the dolichocephalic skull is one in which the breadth is less considerable in proportion to the length; the mesocephalic skull occupies an intermediate position between these two extremes.

Skunk, an animal belonging to the genus *Mephitis*, of the Weasel family, with three species, ranging from Canada and British Columbia to Guatemala. The general coloration is black and white, in broad longitudinal masses, the under surface being black, and the tail is bushy and often held aloft. In these animals the power of discharging the offensive contents of the anal glands reaches its highest development, and the secretion is so foetid that its odour can be perceived at a considerable distance, and often causes nausea, and clothes soiled with it can only be cleansed after repeated washings or hanging in smoke. The creature is able to eject the liquid with unerring aim to a distance of 12 or 14 feet. The secretion is said to cause inflammation of the eyes and, *per contra*, to relieve the distress of asthma. The Skunk's bite has, it is stated, been known to produce hydrophobia. Skunks are nocturnal animals, living on the ground or in burrows, and feeding on small mammals, birds, reptiles, insects, worms, roots, and berries.

Skupshatina, the name of the National Assembly (Narodna Skupshatina) of Serbia and Montenegro.

Skye, ISLE OF, the largest of the Inner Hebrides, Inverness-shire, Scotland, bounded on the N. by the North Minch, on the E. by the Sound of Raasay, Inner Sound, Loch Alsh, and the Sound of Sleat, on the S. by Cuillin Sound, and on the W. by the Little Minch. It covers an area of 643 square miles, is 48 miles long and from 3 to 25 miles broad, its coast being indented to a remarkable extent by Lochs Snizort, Dunvegan, Bracadale, Scavaig, Slapin, Fishort, Broadford, Sligachan and Staffin. The



DIFFERENT SHAPES OF SKULLS.

- | | |
|---------------------------------|----------------------------------|
| A. of Australian (prognathous). | B. of African (prognathous). |
| C. of European (orthognathous). | D. of Samoyede (brachycephalic). |
| E. of European (mesocephalic). | F. of Negro (dolichocephalic). |

united with one another, the intervening sutures being markedly serrated. The suture which separates the frontal from the parietal bones is termed the coronal suture, while that which intervenes between the two parietal bones is called the sagittal suture. Various holes (foramina) perforate the base of the skull, and allow of the exit of the cranial nerves and the blood-vessels. The largest of these is the foramen

surface is mountainous, amongst the principal masses being the Cuchullin Hills—the most finely-marked group of peaks, the highest of which is 3,234 feet above the sea, in the United Kingdom,—the Storr (2,360 feet), and Quiraing



SKUNK
(*Mephitis mephitis*).

(1,779 feet). The streams are little more than mountain burns, torrential in spate. Loch Coruisk is the largest of the freshwater lakes, and is a perfect picture of absolute solitude. The climate is wet and the soil poor, but the crofters manage to eke out a precarious existence by cultivating patches of potatoes, turnips and oats. On the uplands black cattle



SKETCH-MAP OF SKYE.

and sheep are raised in considerable numbers. Though the island has always been a favourite field of study to the geologist, its mineral resources are economically of little value. The importance of the fisheries was enhanced when the railways on the mainland were extended at one point to Kyle of Loch Aish and at another to Mallaig. Whisky is distilled in several places, the brand made at Talisker being one of the most noted in the Highlands and, like Glenlivet, being almost a synonym for whisky itself. Skye is a noted resort for tourists, owing to the extraordinary grandeur and romantic picturesqueness of its mountain and coastal scenery. The greatest of the Skye chieftains is The Macleod, whose fastness at Dun-

vegan is one of the finest castles on the west coast of Scotland. The most famous associations of the island are those connected with the adventures of Prince Charlie after the disaster at Culloden. He was in hiding in several places in the island, including Kingsburgh, where Flora Macdonald, his heroic protectress, was visited by Dr. Johnson in 1773, and where she died on March 5th, 1790. The capital, Portree (2,781), that is, the harbour of the King, or Port Royal—so named in honour of James V.'s visit in 1540—is prettily situated on a small bay on the east coast. Pop. (1901), 13,883.

Skye Terrier, a variety of the Scottish terrier, the origin of which is unknown. In this breed the body is very long, the limbs are short, and the coat, which should be quite straight, is so long as almost to touch the ground when the animal walks. The colour is usually slate or fawn. These dogs, which are kept as pets, require a great deal of attention, or the long coat will soon become anything but an ornament.

Slade, FELIX, antiquary, younger son of Robert Slade, deputy-lieutenant for Surrey, was born in Lambeth, London, in August, 1790. On the death of his elder brother, in 1858, the property of his maternal grandfather, Edward Foxcroft, of Halsteads, Yorkshire, came into his possession. He died, unmarried, on March 29th, 1868. Slade was an enthusiastic collector of books, bindings, engravings, manuscripts, Japanese carvings and pottery. The most important of his collections was that of ancient and modern glass, which he bequeathed to the British Museum. He left £35,000 for the endowment of professorships for promoting the study of the Fine Arts at the Universities of Oxford and Cambridge and at University College, London. A further sum was left to provide six art scholarships of £50 each per annum, to be awarded to students under nineteen in the last-named institution for proficiency. To further Slade's intentions his executors spent an additional £5,000 upon the erection of a suitable building, the Slade School of Fine Art in University College. The first Slade Professor at Oxford was Ruskin; in London, Sir Edward Poynter, P.R.A.

Slag. In the smelting of a metal a flux is usually added to the ores, which combines with the silicious and earthy impurities of the ores to form a fusible substance, which floats above the metal and can be tapped off or withdrawn, and which is known as slag. The slags vary in composition, according to the nature of the ores and flux. They are usually mixtures of silicates of lime, soda, potash, iron, etc., and are generally vitreous compounds closely resembling many of the lavas and volcanic rocks.

Slander is a false and malicious statement concerning anyone made by word of mouth. It gives rise to a right of action for damages if it imputes the commission of a crime for which a

corporal punishment may be inflicted, or the having some contagious disorder which may exclude the person in question from society, or if it has reference to his trade, office, or profession, and is calculated to injure him in such, or if it has caused him special damage.

Slang, used generally to denote a method of speaking in which either artificial words are used to denote ordinary objects, or in which words are employed in other than their ordinary senses. Under the former of these heads may be included the patter of gipsies and vagrants, thieves' Latin, and the cant, as it is called, by which many try to conceal their meaning from the uninitiated. The true Gipsy, *i.e.*, Romany, is not slang, but a distinct Eastern dialect, though it is much corrupted, and many slang words have been introduced into Romany, while many Romany words have been introduced into slang. Many slang words, again, are Old English, or Norse, or Celtic. The word is said to mean, by derivation, secret language. Every class of society has its slang in the second sense of the word—that is, uses in speech, either from affectation, or with a deliberate intention to produce an effect ludicrous or otherwise, a language that it would not use in oratory or in serious writing. Slang is often merely metaphor; for instance, when a Winchester boy speaks of "Moab" for the washing-place, he is using a metaphor arising from a mistaken conception of a Scriptural expression. Slang dictionaries have been compiled, and are of interest to the student and general reader. It will, of course, be understood that colloquialisms, such as "jolly" and "governor" are not slang at all in the strict sense of the word.

Slate, a cleaved, compact, argillaceous rock, which has been to some extent metamorphosed, and is obtained generally from the older geological formations. The rock splits indefinitely in a direction which is generally uniform over a wide area, inclined at a high angle to the horizon, and altogether independent of the nearly obliterated original bedding of the rock. Under the microscope the component particles of the rock are seen not only to be rearranged with their long axes all in one direction, but also to be to some extent compressed, thus giving the "grain" to the rock. Slate differs in colour, being sometimes black, ferruginous, silvery, or green, but more often of a purplish-grey. It often contains scales of mica, minute crystals of garnet, or larger spots of chlorite, andalusite, kyanite, staurolite, or other minerals. The black slates may contain a considerable proportion of organic matter. Those containing garnets or other hard varieties are used as oilstones; but the chief use of the material is for roofing, for which the Bcngor and other North Wales slates and those from the Highland quarries at Ballachulish are the best in Great Britain. Several thousand tons are quarried annually, and over fifty million slates by tale are exported from the

United Kingdom, chiefly to different countries of Europe. Large numbers of small slates are employed for writing purposes in schools, though, for obvious sanitary reasons, their use for this purpose is steadily discouraged by medical officers of public health and is on the decline.

Slaughterhouses are places set apart by municipal or other authority for the killing of cattle and other animals, with a view to avoiding the insanitary effects of having animals killed in all sorts of holes and corners amid human habitations, and to maintaining a better opportunity of inspecting the condition and quality of meat offered for consumption. Napoleon in 1810 established *abattoirs* at Paris, and Edinburgh followed the example in 1851, to be followed by London, which established a slaughterhouse at Islington in 1855. At the present time there are few towns of any pretension which do not possess these institutions. As a good example of them are the lairages at Liverpool, where a cargo of beasts is quickly slaughtered, and the carcasses hung up in well-arranged and ventilated cooling-sheds. The foreign cattle market at Deptford is another example. The principal regulations for building and carrying on slaughterhouses are in the direction of cleanliness, health, and scientific operation.

Slavery, property of man in men, absolute and complete, prevailed from the remotest period of which we have any record. The condition arose usually out of conquest, sale, and kidnapping, while, in a generation, the slave state became hereditary—children born in slavery continued in slavery. Some publicists have ventured to contend that, from a political standpoint, the custom had its merits. For example, they urge that it compelled the slaves to acquire habits of industry. Such specious pleading is, at the very best, merely an attempt to be wise after the event. For it is perfectly certain that such considerations were entirely absent from the minds of those barbarous and semi-barbarous peoples who first made their fellow-creatures their chattels. Not a single nation of antiquity was free from the imputation of actively approving slavery, and a like melancholy statement is true of the Christian era up till a comparatively recent date. The number of slaves in old Greece can only be conjectured, but it seems to have been at one time considerably more than one million. They were employed in field labour, workshops, domestic services, and on occasion in positions of trust and responsibility. A slave might purchase his freedom, or he might be liberated by his owner. The helots of Sparta were slaves actually, but enjoyed the status of serfdom. They were domestic servants, or farm labourers resident on their land and paying to their proprietors fixed dues. Their lot, however, was never enviable, as they were liable to be massacred—"to be spitted and speared," Thomas Carlyle calls

it—whenever they threatened to grow too numerous. In ancient Rome the proportion of slaves has been estimated as that of three to one freeman, which gave in the first Christian century the appalling figure of nearly 21 million slaves. The only wonder is that servile wars were not more frequent. There were two formidable insurrections in Sicily in the latter half of the second century B.C. and about 73 B.C. Spartacus led, with conspicuous courage, a revolt in Southern Italy. The advent of Christianity, though it did not abolish slavery, ameliorated the condition of the slaves in many appreciable ways, especially by the introduction of the status of serfdom; in which while he was not free the serf was allowed some interest in the land he cultivated and some time in which he might work for himself. Thus insensibly he acquired a condition slightly superior to slavery and the seeds of hope and self-respect were sown in his breast. With the decay of feudalism the condition gradually came to an end, in Great Britain in the middle of the 17th century, and in several of the European Powers at various dates in the 18th (Prussia, 1702; Denmark, 1766; Germany, 1781), but it was not till March 3rd, 1861, that Alexander II., Tsar of Russia, proclaimed the emancipation of the serf. Still though serfdom slowly disappeared in Europe, the traffic in slaves flourished, and slavery itself was enforced by several European states. Negroes began to be conveyed from Africa to the New World, Portugal being foremost in encouraging colonial slavery. The treatment by Spain of the Indians of Mexico, Peru and other American countries is yet an abomination to read of. Nor are the hands of Great Britain clean in this degrading and disgraceful traffic. Sir John Hawkins (1532-95) and other gallant sailors thought it no sin to exchange the black man for gold dust, for it was only when their cupidity had been excited that they indulged in the trade. Slavery in the United States is held to date from 1620, when a Dutch ship conveyed a cargo of negroes from Guinea to Virginia and sold them to the tobacco-planters. Within a few years the horrors of the "middle passage" were an accepted fact of history, and the miserable negro came to regard death as his first and best friend. It has been reckoned that up till the end of the 18th century over 70,000 slaves were despatched every year to the United States by the British, French, Portuguese, Dutch and Danes, and that more than half of the infamous traffic was in the hands of Great Britain, which, till not long before the American War of Independence, had also deported British and other offenders to work on the New England plantations. Meanwhile public opinion had been gradually educated on the subject of slavery, thanks especially to the sustained and unselfish efforts of the Quakers, who followed the lead of George Fox (1671). In the next century Granville Sharp was instrumental in procuring, through his protection of the runaway negro Somersett, the

famous declaration that the moment a slave set foot on British soil he was free (1772). The agitation was zealously fomented by Thomas Clarkson, William Wilberforce, Josiah Wedgwood, Zachary Macaulay and other noble men and women, and in 1807 an Act was passed forbidding any vessel from sailing for slaves from any British port and the landing of any slaves in British Colonies after March 1st, 1808. These Acts being systematically violated, other legislation ensued, and finally on August 28th, 1833, an Act was passed abolishing slavery throughout the British Colonies and granting a sum of £20,000,000 by way of compensation to the planters. To Denmark, however, belongs the honour of setting the example of abolition, for in 1792 a royal order was issued stipulating that slavery must cease in Danish possessions from the end of 1802. (Austria had formally abolished it in 1782, but this was, though just and creditable, an academic proceeding, since she had never been engaged in the trade.) The United States prohibited importation in 1808, the Swedish trade ended in 1813, the Dutch in 1814, and the Vienna Congress denounced it in 1815. The French interdiction came into force in 1819, the Portuguese in 1836, the Egyptian in 1881, the Cuban in 1886, and the Brazilian in 1888. Though the United States had forbidden the trade in slaves in 1808, the "institution," as it was euphemistically styled, still remained in full swing. Nevertheless, there were many signs that public opinion wished to end the system at once, and Abolitionists promoted an agitation against it. Certain States which would not give up domestic slavery came to be known as Slave States, namely, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Louisiana, Texas, Arkansas, Missouri, Kentucky and Tennessee. The publication of *Uncle Tom's Cabin* (1852) greatly inflamed public opinion, the Dred Scott decision of 1857, in which a majority of judges held that a slave captured in a free State must forfeit his liberty, still further aggravated it, and the execution of John Brown, who attempted to promote a slave rebellion, in 1859 brought matters almost to a crisis. Abraham Lincoln, the Anti-Slavery candidate, had hardly been elected President in November, 1860, when South Carolina seceded from the Union in the following month and civil war was inevitable. During the strife slavery was officially abolished in the United States on December 18th, 1862, and complete equality between the white and black races was recognised in 1870, although in some towns the civic relations between black and white constituted for a time a menace to social order. Thus in all civilised states excepting Turkey, which has always lagged behind civilisation, slavery and the slave trade have ceased, and it is only in the wilds of Africa and Asia and in some out-of-the-way Pacific isle where man's inhumanity to man, in this form at all events, makes mankind mourn.

Slav Languages, a large group of languages which collectively form a main branch of the Aryan linguistic family, intermediate between the Lithuanian and Teutonic branches, but much more closely related to the former than to the latter. No trace remains of the primitive Slav tongue, whence the members of the group have diverged, and the oldest known form dates only from A.D. 800, when it was reduced to writing by Cyril and Methodius, apostles of the Slav peoples. Their version of the Bible, one MS. of which is dated 1056, gives this idiom a certain pre-eminence as the liturgical language of the Slav Christians; but it is not the Slav mother-tongue, any more than the Gothic of Ulfilas is the mother-tongue of existing Teutonic languages. It is even uncertain in what region of the Slav world this particular dialect was current, although by most authorities it is localised in Bulgaria, and even called "Old Bulgarian" in contradistinction to the extremely corrupt "Modern Bulgarian" now spoken in that district. The other chief members of the family are Great and Little Russian, Serbo-Croatian, Czech, Polish, and Wendish (Lusatian), whose domain and numbers coincide with those of the respective Slav nations as tabulated in the article on the Slav Race (q.v.). In fact, the table there given is based far more on linguistic than on ethnical considerations, as must always be the case in classifications of mixed peoples. In general the Slav languages, always excepting Modern Bulgarian, are more conservative, that is, preserve more of the primitive Aryan formative elements than do their Teutonic, Celtic, and Italic congeners, but in this respect stand on a much lower level than Lithuanian. Thus the Slav declension is still highly synthetic, retaining many of the old case endings which have disappeared from the modern Germanic and Neo-Latin tongues. All three genders persist, as do also very full dual forms of the noun, pronoun, and verb, while the verb itself presents a rich array of personal endings, moods, participles, and tenses, some organic, some later developments, like the Romance future. The Slavonic languages are written with three different alphabets—the Cyrillic, adapted from the Greek with numerous additions by Cyril and Methodius, and generally retained by the Orthodox Slavs with some slight modifications; the Glagolitic, of unknown origin, confined to the Southern Slavs, and now little used; the Roman, in use amongst all the Uniates (Catholics), with numerous diacritical marks and uncouth combinations to express sounds peculiar to the several idioms. The efforts made to reform these somewhat rude graphic systems have hitherto been attended with little success.

Slavonia. [CROATIA.]

Slav Race, a main division of the Aryan family, occupying nearly the whole of East and a large part of South-East and Central Europe, with two chief branches, six sub-

branches, and several minor groups, as shown in the subjoined table:—

| | | | |
|--------------------|---|---------------------|---|
| Slavs, 106,680,000 | Eastern and South-eastern Slavs 85,200,000 | Russians | Great Russians, 73,000,000 Little Russians, White Russians 3,700,000. |
| | | Bulgarians, | Servians, Bosnians, Croatsians, Dalmatians, Montenegrins, Slovenes, |
| | Western Slavs 20,480,000 | Serbs 8,500,000 | Bohemians, Moravians, Slovaks, |
| | | Czechs 7,000,000 | Poles, 13,800,000, Wends (Lusatians), 180,000. |

The Great Russians form the bulk of the population both in European and in Asiatic Russia, to which latter region they have spread in recent times; the Little Russians are confined to South-West Russia (Ukrania) and parts of Austria-Hungary, where they are known as Ruthenians; the White Russians are concentrated chiefly in the western provinces of Russia proper about the frontiers of Poland. The Bulgarians—originally Ugro-Finns, but assimilated to the Slavs in speech, and partly in type, since the 11th century—occupy the whole of Bulgaria and a large part of Rumelia, and have numerous settlements both in Servia and South-West Russia. The Serbs, with their numerous sub-groups, are the dominant people in all the north-western parts of the Balkan peninsula and conterminous provinces of Austria-Hungary. The Czech or Chekh domain comprises over half of Bohemia, the whole of Moravia, and parts of Hungary, especially in the north-west. Since the dismemberment of Poland the Poles are distributed between Russia (Poland proper), Austria (Galicia), and Prussia (Posen). The Wends or Sorbs are a remnant of the extinct Polish Slavs of the Elbe basin, still surviving in Saxon and Prussian Lusatia. Slav, the present collective name of the family, is referred either to the word *Slava* ("glory"), or more probably to *Slovo* ("word," "speech"), as indicating a people of distinct or intelligible utterance. Later it became a term of contempt (*esclave*, *schlavo*, *slave*) amongst the western peoples, owing to the large number of Slav prisoners enslaved during the long struggle for ascendancy between the Slavs and Teutons in Central Europe. The older collective names, Spor and Antes, both first mentioned by Procopius (6th century), are probably to be identified with the Surpe of Alfred [SEB], and the Eneti, Heneti, Veneti, a Sarmatian people of Cisalpine Gaul, whose name survives in the modern Venetia, Venice. The still earlier relations of the Slavs to the Scythians and Sarmatians of the Greek and Roman writers involve obscure ethnical problems which cannot here be discussed. It is no longer possible to determine the original seat of the Slav people; but, from whatever centre the dispersion took place, it is certain that during their migrations they have become largely intermingled with Finns, Tatars, Teutons, Celts, Thracio-Illyrians, and many other races, so that it is no longer

possible to speak of a pure Slav physical type. The primitive stock was probably blonde (blue or grey eyes and light hair) like the Teutonic; but at present the most marked general feature is brachycephaly (round head), showing a profound divergence from the primitive dolichocephaly (long-shaped head) of the Aryan people, and a corresponding approach to the brachycephalic Mongol type. Other distinguishing features everywhere cropping out in the various groups are a somewhat swarthy complexion, short, straight, or slightly concave nose, small deep-set eyes, straight or wavy dark-brown hair, full beard and medium stature, although the Bosnian Serbs are amongst the tallest people in Europe. In general, the fair type may be said to prevail amongst the Poles, Wends, Great and White Russians, the brown amongst the Serbs and Little Russians, while the Czechs present an almost equal mixture of both. In the moral order the Slavs seem to hold a somewhat intermediate position between the Teutonic and Latin peoples: far less phlegmatic than the Germans, while nearly as quick and vivacious as the Italians and French. Hence the remark often made that the Slavs are southerners who have strayed eastwards; hence also perhaps the more than passing sympathy entertained by the Russians for the French despite wars and political rivalries. Within the several branches the national sentiment is strongly developed, as shown especially by the historic records of the Czechs, Poles, and Serbs. But the idea of a Pan-Slav empire is visionary because of the deep-rooted religious and political antagonisms, strengthened by linguistic differences, as between Roman Catholic Poles and Czechs and Orthodox Russians, or between Ruthenian Uniates and Bosnian Mohammedans, all doubtless of Slav speech, but speaking mutually unintelligible dialects of the primitive Slavonic language.

Sleep, in animals, is a normal condition of the body, recurring at more or less regular intervals, in which there is functional inactivity of the brain and spinal column and consequently of the nervous system generally. Sleep in plants is the assumption by leaves, especially the leaflets of compound leaves, of the nocturnal position, which is generally a folding in a vertical plane, under the influence of darkness or excessive illumination. The movements exhibited are identical with those induced in some of the cases, such as the sensitive plant, by contact, and with those which occur spontaneously, in spite of the inhibitory action of light, in others, such as the telegraph plant. Sleep movements only occur between 15° and 50° C. Prolonged darkness destroys the power; but for a time the leaves of the sensitive plant, in the dark, exhibit spontaneous alternating movement, like those of the telegraph plant. Sudden variations in the intensity of light induce "sleep." The mechanism of the movements consists, as in the sensitive plant, in the action of the pulvini.

Sleeping Sickness. In the days of the slave trade a mysterious disease, known as the Sleeping Sickness, was familiar to the slave traders and to the slave owners on the plantations. It was notorious that during the passage across the Atlantic the negroes perished in large numbers, a proportion of them from this peculiar negro disease. It was also known that for several years after the negroes were landed and had been at work some of them might sicken and die from the same cause, although their companions, the negroes born on the plantations, were completely immune from the Sleeping Sickness. It was noted that in most of the negroes who subsequently succumbed to this disease, even before the on-coming of the more characteristic symptoms, the glands of the neck were enlarged—not, as a rule, to a great degree, but sufficiently to render them easily palpable. In certain districts in Africa the natives understood the significance of these enlarged glands, which they often excised with the idea of preventing what they knew would otherwise be inevitable, and the slave dealers would reject all such slaves, for they, too, knew that to take them would be to lose them later from Sleeping Sickness. Since the beginning of the 19th century accounts of the disease by medical writers had appeared from time to time, and its symptoms and epidemiology were more or less accurately described. It was regarded as a disease of the nervous system, peculiar to West Tropical Africa, and a variety of unsubstantiated speculations were indulged in as to its cause. The more accurate study of Sleeping Sickness dates from the opening of the Congo basin, and more especially from the appearance of the disease in Uganda about the beginning of the 20th century and the recognition of its cause in a minute organism—*Trypanosoma gambiense*—in 1902. Practically nothing is known of the history of Sleeping Sickness in Africa prior to the beginning of the 19th century. It is quite possible that in the remote past it has swept many times over the tropical parts of the continent, as it is doing at the present day. However that may have been, when in modern times Europeans first got in touch with Tropical Africa, Sleeping Sickness appears to have been confined to limited districts on the west coast and the immediate hinterland. Soon, however, after the advent of the European in the Congo basin, and the consequent increased movement and travel on the part of the native population, it was remarked that the Sleeping Sickness, which hitherto had been confined to the lower part, had begun to spread to the upper reaches of the great river and its affluents. Villages were becoming depopulated, and an immense mortality was in progress. Several European missionaries and officials who had visited the affected districts were attacked and succumbed to the disease, showing that the disease was not peculiar to the negro as at one time had been supposed. Finally, towards

the end of the 19th or the beginning of the 20th century, Sleeping Sickness appeared in the Nile basin, on the shores of Victoria Nyanza, and has already claimed as victims 200,000 of the 300,000 inhabitants of the affected districts. It has also spread down the Nile Valley, and has appeared on Lake Tanganyika as well as on the upper waters of the Lualaba, threatening to invade the Zambesi basin. To say the least of it, the situation for Africa and those interested in Africa is a grave one. This will be readily comprehended when the deadly nature of the disease is considered, the persistency with which it clings to an invaded village or district, the number of people it attacks, and its indifference to age and sex. To the lay observer, the first indications of Sleeping Sickness are gradually, though in-

themselves on the skin of the trunk, face, and limbs. Sometimes the features and limited areas of the body are slightly puffy and swollen. In both negro and white man the lymphatic glands, especially of the neck, are enlarged and occasionally tender. The condition of the patient may once or oftener undergo temporary improvement, but sooner or later the lethargy deepens into complete indifference or prostration, the body wastes, various nervous symptoms, such as local or general convulsions or paralysis, may set in, bed sores form, hyperpyrexia, diarrhoea, dysentery, pneumonia, or other intercurrent diseases may supervene and rapidly carry off the wasted, half-starved wretch (Fig. 1). There is great variety in the grouping of the symptoms of Sleeping Sickness and in the superimposed morbid conditions, but the essential symptoms, namely, irregularly progressive mental and physical lethargy, irregular fever, enlargement of the lymphatic glands, and the occurrence of a peculiar micro-organism—to be presently alluded to—in the blood and lymphatics, are present in all cases. The disease may run its course in a few weeks or months; its average duration in the negro may be about three months, dating the illness from the oncoming of marked symptoms of lethargy. Some cases drag on for, it is said, as long as three years. Dating the disease from the presumed time of infection, it is believed that it may last for upwards of seven years; the negroes say that a man is not safe until seven years have elapsed from the time he has visited a Sleeping Sickness district. Manifestly, Sleeping Sickness is a disease affecting the

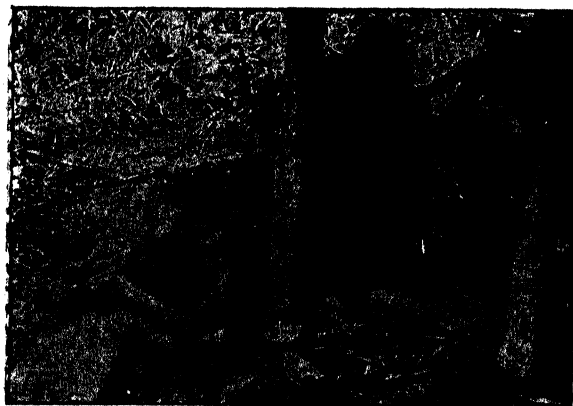


FIG. 1.—BOY DYING OF SLEEPING SICKNESS.

terminatingly increasing lassitude, together with occasional headache and feverishness; and, it may be, a tendency to fall asleep at unusual times. This sleep is not of a profound character, nor is it always a pronounced symptom. The word "lethargy" is perhaps a more correct term for the condition. At first the stricken negro may try to do his work, but he is easily tired, and prefers to dawdle over it, or to lie about his hut, or to bask in the sun. When he walks he shuffles along slowly or even staggers like a man newly aroused from sleep. His face wears a morose and taciturn expression, the upper eyelids half closed, the lower lip drooping, and the saliva perhaps dribbling from the corners of his mouth. There may be tremor of the hands and tongue, speech is slow, and conversation is not sought for. Although occasionally there is some mental aberration, anything in the nature of insanity is unusual. In the negro there is often intense itching, especially of the skin of the chest; and in the white-skinned European great patches of a peculiar red congestion, often in the form of rings, may show

nervous system, but an ordinary post-mortem examination affords no explanation of the symptoms during life. There is no gross lesion that can be said to be invariably present. Usually indications, more or less distinct, of inflammation of the coverings of the brain are to be made out; but these are not generally very marked, and not infrequently they are not apparent to the naked eye. But a microscopical examination reveals, both in the coverings and in the substance of the brain, a very definite and extensive infiltration with small mononuclear cells of the lymphatic tissue surrounding the blood vessels, a condition which is undoubtedly at the root of the peculiar symptoms present during life, and which is only a part of a general chronic inflammation or irritation of the lymphatic system as a whole. The cause of Sleeping Sickness has been a subject for speculation ever since the special nature of this disease was recognised. When it occurred in the imported negroes in the West Indies, it was regarded by some as a severe form of nostalgia or home-sickness; when it occurred in the negro in his native

village it was variously attributed to manioc poisoning, to drugs, to intoxicants, and to many equally unlikely agencies, now known to have nothing to do with the disease.

In 1891 Forde, a colonial surgeon, found a peculiar organism in the blood of an Englishman suffering from an obstinate and irregular form of fever. He showed the organ-

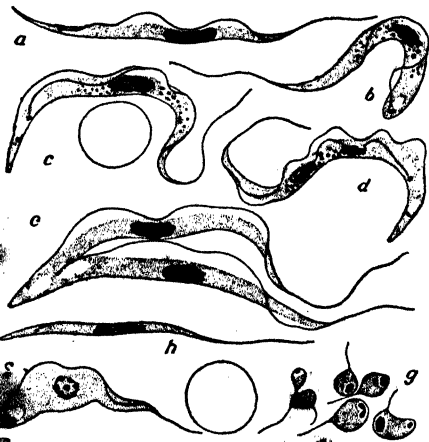


FIG. 2.—*TRYPANOSOMA GAMBIENSE*: VARIOUS FORMS FROM BLOOD AND CEREBRO-SPINAL FLUID.

a, Elongated anterior extremity; b, blunt ditto; c, d and e, dividing forms; f and h, probably sexual forms; g, from cerebro-spinal fluid.

ism to Dutton, who recognised its nature and described it under the name *Trypanosoma gambiense* (Fig. 2). Similar organisms had already been found to be the cause of such deadly diseases of domesticated animals as the surra of India, the nagana or tse-tse fly disease of Africa, the *mal de coit* of South Europe and North Africa, and the *mal de caderas* of South America. Dutton showed that *T. gambiense* gave rise to a chronic form of fever, a peculiar skin eruption and other symptoms, but that these were the early stages of the deadly Sleeping Sickness was not suspected until Castellani found the trypanosoma in cases of the latter disease in Uganda in 1903. Since that important discovery the trypanosoma has been definitely linked up with that disease as cause and effect. It is present in the blood, lymphatics or tissues in all cases, and at one time or other in their progress can be demonstrated microscopically, or by the injection of the blood of the patients into certain of the lower animals in whose blood it multiplies rapidly and usually proves fatal. There can be therefore no longer any doubt that *T. gambiense* is the cause of Sleeping Sickness. Soon after Castellani made this important discovery, Bruce, who some years previously had shown that the nagana or tse-tse fly disease

of domestic quadrupeds was caused by *Trypanosoma brucei*, brought forward evidence to show that *T. gambiense* was transmitted similarly by tse-tse flies, in the latter case by the species known as *Glossina palpalis*. There can be no doubt that *T. brucei* is transmitted by a *Glossina*, but although analogy, the facts of distribution of fly and disease, and, up to a point, experiment support the belief that *G. palpalis* transmits the trypanosoma of Sleeping Sickness, the proofs are not quite complete, and there is yet greater uncertainty as to the exact way in which the transmission is effected. The trypanosome (which is a very active minute, colourless, slender, spindle-shaped body, usually with a long lash at one end, the whole organism being about twice as long as the breadth of a red blood-corpuscle) is, as already stated, frequently present in the blood where it is sometimes seen to multiply by a process of longitudinal division. The tse-tse flies are voracious blood-suckers, and it is held by Bruce and some others that in passing from an infected man to, it may be, a hitherto uninfected man it conveys on its blood-smeared mouth parts the trypanosome and so inoculates the infection as a lancet does vaccination. Others hold that the *Glossina* serves the trypanosome as the mosquito does the filaria, or the malaria parasite, or as the tick does the pyroplasma of Texas fever, acting as an intermediary, in which, or in whose larva, necessary processes of development have to be gone through before the trypanosome can be effectively inoculated by bite or otherwise transferred. The important point to settle, however, is the necessity for the tse-tse fly in the transmission of Sleeping Sickness; it is now generally regarded as being settled in the affirmative. There are several species of tse-tse, all of them, like Sleeping Sickness, peculiar to Africa. A point not yet settled, and it is one of great practical importance, is which of the ten or eleven species are capable of transmitting the trypanosome. Is *G. palpalis* the only efficient intermediary, or are several or all of the tse-tse flies capable of spreading Sleeping Sickness? *G. palpalis* is comparatively localised in its distribution, but there are few places in Tropical Africa in which one or more of the other species are unrepresented. The tse-tse flies—about the size of a horse fly—are in many respects peculiar. The female does not lay eggs; she produces larvae—one at a time,—each of which buries itself in the ground before assuming the pupa stage from which the mature insect emerges. *G. palpalis* occurs only close to open water and in well-shaded jungly places (Fig. 3). Some of the other species, *G. morsitans*, for example, seem less dependent on shade and water, being common on



FIG. 3.—*GLOSSINA*, SHOWING POSITION OF WINGS WHEN AT REST.

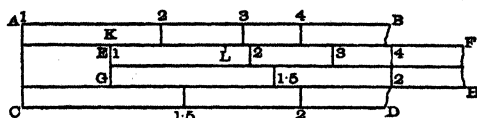
open grassy land where water may be scarce. Both sexes of the tse-tse flies are blood-suckers. They are active only during the day time, when they will attack any man or animal passing near their haunts, following them with persistency, it may be, for half a mile or even farther. When fed they return to their home—in the case of *G. palpalis*, the waterside. There are some grounds for the hope that *G. palpalis* is the chief, perhaps the only intermediary of *T. gambiense*, in the circumstance that hitherto it has been invariably found when properly sought for wherever Sleeping Sickness is in evidence, and that Sleeping Sickness is for the most part acquired near the banks of lakes and rivers, facts tending to indicate that the association of the disease and insect is constant and, therefore, probably necessary. Should the other tse-tse flies also prove efficient intermediaries for the trypanosome, then the outlook for Tropical Africa is grave indeed. Even if *G. palpalis* be the only intermediary, its habit of haunting the banks of open waters makes it extremely formidable, for the open waters are the principal highways of travel and communication in Africa and along them the principal part of the population is distributed. Something can be done to diminish the risk of contracting infection by the trypanosome and in modifying or suppressing the infection when acquired. By removing the undergrowth in a locality infested by *G. palpalis* the fly can be got rid of, and where this measure has been thoroughly carried out—as at Entebbe—the results are encouraging. Until recently the subjects of Sleeping Sickness and even of trypanosoma infection were regarded as doomed. Possibly a proportion recover spontaneously from trypanosomiasis if the nervous system has not become seriously involved. In preparations of arsenic, in certain dyes, in mercury, and in various combinations of these substances we have agencies of marked therapeutic power over the trypanosome and there are good grounds for hoping that, in at least some instances, their vigorous and judicious use will effect permanent cure.

Slickenside, a mining term originally applied to a smooth lustrous surface of specular galena in veins in the Carboniferous Limestone of Derbyshire; but now used for any rock-surface that is smoothed by friction against another, as is often the case in a fault.

Slide Rule is a mechanical contrivance for performing the operations of multiplication and division. It consists of a graduated rule (see Figure), *A B C D*, having a dovetailed groove in which a second rule, *E F G H*, can slide, the faces of the two being flush at the upper side. The corresponding scales on the rule and slide are identical, and are such that the distance from the mark 1 to the mark 2 is proportional to the logarithm of 2 (Logarithms).

The distance from 1 to 3 is logarithm 3, and so on up to 10; and the spaces between these marks

are further subdivided logarithmically, the fineness of the dividing depending upon the length of the rule. Confining our attention for the moment to the scales *A B* and *E F* only, suppose that the mark 1 on *E F* is made to correspond with some mark on *A B*—say that corresponding to logarithm 1,545, which is at *K*. Now take any mark on *E F*—say *L*, which corresponds to 174; it is clear that the distance



SLIDE RULE.

from *A* to *L* corresponds with logarithm 1,545 and logarithm 174, and the point on *A B* which is now opposite *L* will be marked with the number whose logarithm is logarithm 1,545 + logarithm 174—that is, with the product of 1,545 and 174, for the sum of the logarithms of two numbers is the logarithm of their product. We can perform division by reversing this process; if we set a number on *E F* opposite a number on *A B*, the distance from *A* to mark 1 on the slide will be the difference between the logarithms of the two numbers, and mark 1 on the slide will be opposite their quotient. If we have a small brass slide with a mark on it (called a cursor) which fits over the rule, we can set its mark opposite the result of one operation, and use that point as the basis of further multiplication or division without actually reading the number, and in this way complicated calculations may be made without any use of paper or pencil. It is usual to duplicate the divisions on *A B* and *E F*—i.e., make the length from *A* to the end of the rule correspond to logarithm 100, and to graduate the lower half of both rule and slide (*C D* and *G H*) in such a way that the distance from *A* or *E* to any number is one-half the distance from *C* or *G* to the same number. As the logarithm of the square root of a number is half the logarithm of the number, it is evident that the root of a number is to be found on *C D* opposite the number on *A B*, and that squares may be found in the converse manner. Special marks are also made to correspond with constants which are often needed (such as π) and considerably facilitate many calculations. No account is taken on a slide rule of the index of the logarithm, so that the position of the decimal point must be determined by inspection of the numbers. Slide rules of circular or spiral form are sometimes used, but the one above described is the most common form.

Sligo, a maritime county in the province of Connaught, Ireland, bounded on the N. by the Atlantic, on the N.E. by Leitrim, on the S.E. by Roscommon and on the S. and W. by Mayo. It occupies an area of 707 square miles. The

coast is deeply indented by the bays of Sligo and Killala, and the surface, low and swampy towards the sea, rises in the north and west to various heights, the most considerable being King's Mountain (1,965 feet), Benbulbin (1,722), Ox (1,600), the Slieve Gamph (1,300) and Gullagherboy (1,430). The Arrow, Moy, Owenmore and Garvogue are navigable rivers, and fish abound in all the streams and on the coast. The principal loughs are Gill, Arrow and Gara. Copper and iron occur, but are not worked. The chief crops are oats, potatoes and turnips, wheat and barley being grown only to a small extent. The moist climate is better adapted for the raising of live-stock, which includes large numbers of poultry, cattle, sheep, pigs, asses, horses and goats. Weaving, tanning, distilling and brewing form the leading industries. Sligo is the county town. Pop. (1901), 84,083.

Sligo, the capital of County Sligo, Ireland, and an important seaport, at the mouth of the Garvogue, near Lough Gill, 112 miles N.W. of Dublin. The principal structures are the modern Catholic Cathedral in the Norman style, the town hall, the exchange and court house. The prime object of interest are the ruins, amongst the finest of the kind in the country, of the ancient abbey founded in 1252 by Lord Justice Maurice Fitzgerald. It was partially burned in 1414 and in 1642. The best-preserved remains are the eastern window, the tall tower at the junction of the nave and chancel and three sides of the cloisters of the quadrangle. The town is a busy trading centre, and there is frequent communication with Londonderry, Liverpool and Glasgow. The exports are cattle, fowl and dairy produce, the imports coal, iron, timber and provisions. Despite its somewhat decayed appearance, the town is fairly flourishing. Pop. (1901), 10,862.

Slipper-Animalcule, or **PARAMECIUM**, a genus of Infusoria very abundant in fresh or salt water containing much decomposing vegetable material. The animal is of much value, as the action of the contractile vesicles and the stellate form taken by them during contraction can be easily studied in it. *P. aurelia* is the commonest species: it is usually a little less than one-hundredth of an inch in length.

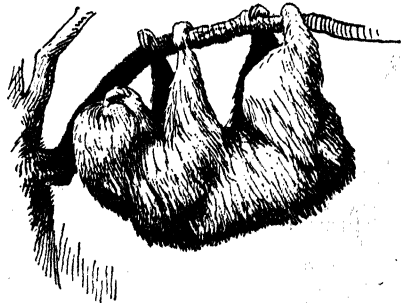
Sloane, **SIR HANS**, physician, was born at Killileagh, or White's Castle, County Down, Ireland, on April 16th, 1660. He studied medicine at Paris and Montpellier and graduated M.D. at the University of Orange in 1683. Two years later he was elected F.R.S., and after a residence in Jamaica, settled in London in 1689, where his professional and scientific repute speedily insured him success. In 1707 he published the first volume of his *Voyage to the Islands of Madera, Barbadoes, Nieves, St. Christopher's, and Jamaica, with the Natural History of the last* (the second did not appear till 1725). He was the first medical man who ever won hereditary honours, receiving a

baronetcy from George I. in 1716. Successively Physician-General to the army and to the king, President of the Royal College of Physicians, and the Royal Society (1727, in succession to Sir Isaac Newton), he amassed a large private fortune, much of which was devoted to the collections that formed the nucleus of the British Museum. He died at Chelsea on January 11th, 1753. To the Apothecaries' Society of London he devised the famous Botanic Garden at Chelsea (with reversion jointly to the Royal College of Physicians and the Royal Society, should the Apothecaries cease to cultivate it). His daughter Elizabeth married the second Baron Cadogan and carried much of Sloane's property into that family, but such names as Sloane Street, Sloane Square and Hans Place perpetuate the wise physician's memory.

Sloe (*Prunus spinosa*), also known as **BLACK-THORN**, with dark-grey bark, spinous branches, precocious white flowers, elliptical leaves, and globose, dark-purple, glaucous drupes. The shoots make excellent walking-sticks; the leaves are said to be used to adulterate tea; and the fruits, which are sour and rough in taste, are eaten by children, preserved, and used not only to flavour spirits, but also are themselves the main ingredient, when distilled, in a spirit known as sloe gin. The shrub is the badge of the M'Quarrie clan.

Slojd ("SLEIGHT") is an institution which originated in Finland and Sweden, and consisted in teaching handicrafts in schools, so as to educate the hand and eye of a pupil as well as his intellect. He begins by making small objects of use or ornament, passing on, as he gains in power, to more elaborate and more useful work. A similar principle, though of a more elementary character, lies at the root of the Kindergarten system and, on much more elaborate and more systematised lines, is the root-idea of technical education.

Sloth, an animal belonging to the Edentate family Bradypodidae, with two genera (*Brady-*



pus and *Cholæpus*) from Central and South America. In the first genus, to the species of which the name "Ai" is often applied from their cry, there are but three functional digits

on the fore-limbs; in the second there are two. They are vegetable feeders and arboreal in habit, and move along the branches of trees, with the body downwards. The body is covered with long, coarse hair, which is often covered with a growth of green algae. The largest of the family is about 30 inches long. The Sloth has neither incisor nor true canine teeth and the back teeth—the false and true molars—are extremely simple in structure, in accordance with the elementary nature of the masticating process which is concerned solely with the munching of leaves and twigs. In eating it usually works its jaws upwards and downwards and not from side to side. The mobility of its head is due to the fact that it has nine neck bones (vertebræ of the cervical region) instead of the seven usually found in the other mammals. Leading monotonous lives, their food always at hand and plentiful, the struggle for existence with other animals seems to have no interest for Sloths. Their enemies are snakes and carnivores, but their habits protect them to a large extent from the assaults of the latter. There thus being little demand on their nervous energy and intelligence these are at a low pitch, and the convolutions of their brain are shallow and few in number.

Sloth Bear (*Melursus labiatus*), a bear of India and Ceylon, from five feet to six feet long; with a long flexible snout and lower lip, black fur, and a light V-shaped mark on the breast. It is an awkward, ungainly creature and feeds on ants and other insects, honey, fruit and birds' eggs. It has remarkable strength of suction and also of propelling wind from its mouth, properties which it turns to account in procuring some of its food. When it comes to an ant-hill, for instance, it scrapes away the earth until it reaches the combs at the bottom of the galleries. Then its violent puffs scatter the dust and loose particles, and when these are removed it is enabled forcibly to suck out the inmates of the combs and even large larvæ at considerable depths below the surface. The noise of its inspirations is audible at a distance of 200 yards or even more. It seldom attacks man unless provoked, but is a dangerous assailant from its singular habit of making for the face and especially the eyes.

Slough, a town of Buckinghamshire, England, 2 miles N. of Windsor. The principal buildings are St. Mary's Church, the British Orphan Asylum, and the Leopold Institute, erected in 1887 to the memory of the Duke of Albany. Upton Court, a fine old house, was once a religious house in connection with the convent of Merton in Surrey. Observatory House was the residence of Sir William Herschel, the astronomer, who settled here in 1781 and died in it on August 25th, 1822. His son, Sir John Herschel, also famous as an astronomer, was born here on March 7th, 1792. It is said that many of the inhabitants of Slough would prefer the town to be named Upton Royal, but a deaf ear has thus far been turned to their

prayer. Burnham Beeches and Stoke Poges are near the town, which is almost wholly a residential quarter, though nurseries and market-gardening are flourishing industries. Pop. (1901), 11,453.

Slovaks, a Slav people of North-West Hungary, numerous especially in the Waag and Gran valleys and about the head-waters of the Taracz and Tapolcz affluents of the Theiss, with scattered groups in the Budapest district and in other parts of Hungary as well as in Moravia. Slovak, which is a distinct dialect of Czech (Bohemian), is spoken altogether by about 2,000,000 people. The physical type is distinguished by very round and low head, stature below the average, and a large percentage of blondes (fair hair, blue or grey eyes), due probably to German intermixture. The Slovaks are two-thirds Roman Catholic and one-third Protestant.

Slovenes (SLOVENCI, SLOVINTZY), a Slav people of the Austrian provinces of Istria and Carniola and the districts bordering on Styria and Carinthia. They speak a Serbo-Croatian dialect and number some 1,250,000, most of whom belong to the Roman Catholic Church. Like the kindred Croats, the Slovenes are physically a fine race, tall, well-made, generally with dark-brown hair and moderately round head. Though now yielding to the Serbo-Croatian, the Slovene language has been long cultivated, and has had two literary periods: a Protestant in the 16th century (when a translation of the Bible appeared), followed in the 17th and 18th centuries by a Catholic reaction, when most of the works of the early Reformers were burnt by the Jesuits.

Slow-Match, used in blasting to enable the workmen to retreat to a safe distance before the ignition of the explosive, and for the firing of shells, etc. It consists of some material the burning of a given length of which will occupy a fairly definite time. A fibrous wick, soaked in a solution of nitre and dried, is one of the oldest devices, but a tube filled with a composition similar to that used in the manufacture of fireworks is often employed.

Slugs, terrestrial gastropods belonging to the family Limacidae of the order Pulmonifera, or air-breathing Snails, inhabiting all the northern temperate regions of the globe. They have no true shell, the head and tentacles are retractile, and the breathing and visceral organs are incorporated within the straight contractile body. The rudimentary shell (where it occurs) is usually internal (in Testacella it is external), and takes the form of a small shield-like plate covering the respiratory apparatus. Slugs shun daylight, indulging their voracious appetite by night. They frequent gardens and hedges in damp places and are also found in cellars, out-houses, and old walls and under stones and about pumps. They usually feed on vegetable

matter, but *Testacella*, which burrows to a depth of two or three feet, devours worms. They secrete a very viscid mucus from all parts of the body. The secretion is a necessary of life. Were it to cease and the integuments to dry the Slug would die. By allowing this mucus to accumulate at the end of its tail and to harden into a gelatinous thread, the Slug can lower itself to the ground from a tree, shrub, or even a shelf in a room. The animal functions are not suspended during hibernation and the creature is always tenacious of life. In the genus *Limax* the creeping-disc extends the whole length of the animal, but it often raises its head like a snail and moves its tentacles in search of objects above. When alarmed it withdraws the head beneath the mantle and contracts the foot. In winter and dry weather it buries itself in the ground. *Limax* has 22 species in Europe and the Canaries. The genus *Arion* differs from *Limax* in the presence of a pore or gland at the extremity of the tail for the more copious secretion of mucus, and in having the pulmonary sac and overlapping shield nearer the head with the breathing orifice in front. Six species occur in Europe and Africa. In *Testacella* the shell is small and ear-shaped and placed at the hinder end of the body, which is broadest behind and tapers towards the head. During winter and dry weather it constructs a kind of cocoon in the ground by the secretion of mucus. Three species are met with in Great Britain, the South of Europe and the Canaries. Slugs in gardens must be hunted for by lantern light after dark. Applications of salt, or soot, or lime (repeated if necessary) usually kill them and they may be trapped by laying down cabbage and lettuce leaves, beneath which they will generally be found in some numbers.

Smallpox: Variola. An infectious disease, the chief symptoms of which are fever and a characteristic eruption, at first papular, then vesicular, and ultimately pustular. The malady appears to have prevailed in Europe in the early centuries of the Christian era, and it was recognised and described by the Arabian physicians. It is known to have caused considerable ravages in various parts of the world during succeeding ages, and until the end of the 18th century was regarded as one of the most serious epidemic diseases. The introduction of inoculation into Great Britain in the 18th century seems to have, in some degree, diminished the amount of injury wrought by smallpox, and with the growth of the practice of vaccination introduced by Edward Jenner (1749-1823) in 1793 and subsequent years, the prevalence of the disease has markedly declined. An outbreak occurred in London in the latter part of 1901, but though severe, it was not so widespread as visitations of former years.

Symptoms. The period of incubation of smallpox is usually about 12 days. On or about the thirteenth day after the exposure of

a susceptible person to infection, a rise of temperature occurs, with shivering, aching of the limbs, vomiting, headache, and intense pain in the back; on the third day counting from the beginning of the initial symptoms, the rash develops in the form of minute reddened papules, which appear first on the face, neck and wrists, and later become generally distributed over the body. The spots have at the outset a hard "shotty" feeling when touched; they increase in size, and in the course of about three days they have developed into vesicles, and in three days more into pustules. Sometimes the pustules are quite distinct from one another (discrete smallpox); sometimes they run into one another (confluent smallpox). The pustules when fully developed usually present a central depression; this is called the umbilicated appearance. The temperature, which at the outset may attain a considerable degree of elevation, usually falls when the eruption first appears, and again rises (secondary fever) when the pustules become formed. After a few days in cases which do well the fever again subsides, the pustules dry up, and convalescence supervenes. In the severer forms of the malady extensive scarring of the skin occurs, in the milder forms there is only slight pitting, and in the mildest no traces of the disease are left. The chief sequelæ of smallpox are ophthalmia, otitis, laryngitis, and lung troubles. The severity of the disease bears a distinct relation to the extent of development of the eruption. Discrete smallpox is rarely fatal, while in confluent smallpox nearly half of those attacked die. Malignant smallpox is the variety of the disease in which the early symptoms are especially severe, in which hæmorrhages beneath the skin and conjunctivæ occur, and in which a fatal issue supervenes usually before the eruption has had time to become developed. The desirability of isolating smallpox patients in hospitals, as soon as the nature of the malady becomes apparent, cannot be too strongly insisted upon, and any persons who have been brought into contact with the infected individual should at once seek advice as to the necessity for being revaccinated.

Smaltite, an arsenide of cobalt, occurring in isometric crystals of a tin-white colour; it frequently contains nickel and iron.

Smart, CHRISTOPHER, poet, was born at Shipbourne, near Tonbridge, in Kent, on April 11th, 1722, and was educated at Maidstone, Durham and Pembroke Hall (now College), Cambridge, of which he was elected a Fellow in 1745. He fell into extravagant ways and contracted debts, which ultimately led to his leaving Cambridge for London. He won the Seatonian Prize in 1750 and several successive years for the best poem on the attributes of the Almighty, but after he settled in London was content to work for John Newbery as a hack. In 1756 he published a literal prose translation of Horace, which had for a long

period an enormous vogue, but the poem by which he lives is *A Song of David* (1763), exquisitely finished in parts and splendid in its solemnity, which elicited even extravagant eulogy from Robert Browning and Dante Gabriel Rossetti. The unfortunate poet, insolvent and too fond of the glass, died in the rules, or precincts, of the King's Bench in London on May 21st, 1771.

Smart, HENRY THOMAS, organist and composer, son of Henry Smart, musician and inventor, was born in London on October 26th, 1813, and as a boy laid the foundation of his profound knowledge of the organ by his visits to Robson's organ factory. After declining a commission in the Indian army he was articled to a solicitor, but his natural gifts proving irresistible he left law to study music. In 1831 he became organist at Blackburn, Lancashire, and while there produced his first important composition, an anthem for the tercentenary of the Reformation, which was performed in the parish church on October 4th, 1835. Returning to London in the following year he became organist of St. Philip's Church, Regent Street. In 1844 he was appointed organist of St. Luke's, Old Street, and in 1864 of St. Pancras Church, where he remained until 1878. During the last years of his life he was blind and his compositions had to be dictated. In recognition of his services to music in June, 1879, Government granted him a pension of £100 a year, but after long suffering he died of cancer, July 6th, two days before it was gazetted. A fine player and a voluminous composer of church music, part songs and cantatas, his best-known work was *The Bride of Dunkerston*, written for the Birmingham Festival of 1864.

Smart, JOHN, painter, was born in Leith on October 16th, 1838, and educated at the High School of Leith. He studied art at the Trustees' School in Edinburgh, and was apprenticed as an engraver in 1853. In 1860 he became a pupil of Horatio MacCulloch, R.S.A., and began to exhibit landscapes in 1861. He was elected an Associate of the Royal Scottish Academy in 1871, reaching the full membership six years later. Among his best works were "Where Silence Reigns," "The Graves of our ain Folk," "The Land of MacGregor," "The Cradle of Argyll," "Among the Silent Hills," "The Pass of Brander," and "The Golf Greens of Scotland." He died in Edinburgh on June 1st, 1899. He painted the hills and glens, the lochs and burns of Scotland with singular power and felicity, and his pictures were charming without resort to meretricious artifice.

Smeaton, JOHN, engineer, was born at Austhorpe, near Leeds, on June 8th, 1724, and educated at Leeds Grammar School. He went to London in 1742 to study for the legal profession, but having great mechanical skill and a strong dislike for law, in 1750 he set up in

business as a maker of mathematical instruments, and soon began to send papers on scientific subjects to the Royal Society, of which he was elected Fellow in 1753, winning



THE REMAINS OF THE SMEATON LIGHTHOUSE,
AND THE NEW LIGHTHOUSE AT EDDYSTONE.

(Photo: W. Heath & Co., Plymouth.)

the gold medal in 1759. He had gradually been drawn towards hydraulic engineering, and, when the Eddystone lighthouse, designed by Rudyerd, was burned down in 1755, was consulted as to its rebuilding. He undertook to construct a new tower in stone; the work was begun in 1756 and the light was exhibited for the first time on October 16th, 1759. The main column was 70 feet high, exclusive of the lantern and bell, which carried it 28 feet higher. The diameter at the base was 28 feet and 15 feet at the top. The light employed was 24 candles carried in a chandelier. This lighthouse stood till 1877, when, owing to the undermining of part of the reef on which it stood, a new structure was necessary. This was built on another part of the reef and when finished in 1882 Smeaton's tower was carefully taken down, the stones being numbered, and re-erected on Plymouth Hoe, all save the base, which was left on the reef in *memoriam*. The lighthouse that figured on the reverse (or "Britannia" side) of one of the Victorian pennies was said to have been modelled after Smeaton's Eddystone. Smeaton now obtained an enormous practice as an engineer, especially in the building of bridges—of which those at Perth, Banff, and Coldstream were amongst his best,—but he did not neglect mechanics, and brought the atmospheric steam-engine to high perfection. He was also the engineer of the Forth and Clyde Canal from Grangemouth to Bowling, begun in 1768 and completed in 1790. The harbour works at Ramsgate, completed in 1774, furnished another example of

his skill. He died at Austhorpe on October 28th, 1792.

Smedley, FRANCIS EDWARD, better known as FRANK SMEDLEY, novelist, only son of Francis Smedley, was born on October 4th, 1818, at Great Marlow, Buckinghamshire. Being seriously crippled he was privately educated at Brighton and afterwards by his uncle Edward Arthur Smedley, chaplain of Trinity College, Cambridge, who was also vicar of Chesterton near Cambridge. At Chesterton he gained an intimate knowledge of University life and his inability to join in outdoor sports seems to have quickened his interest in them. His first and best book, *Frank Fairleigh; or, Scenes from the Life of a Private Pupil*, contributed anonymously to *Sharpe's London Magazine* during 1846-8, proving successful was expanded and published in 1850, with illustrations by George Cruikshank. *Lewis Arundel*, 1850, also appeared in the same magazine, of which he became editor for two years. *Harry Coverdale's Courtship*, illustrated by Phiz, was published in shilling monthly parts in 1855. Smedley died suddenly in London on May 1st, 1864, and was buried at Great Marlow.

Smelt (*Osmerus eperlanus*), a British food-fish of the Salmon family, of trout-like form, with projecting lower jaw. It is fairly common round the British coasts and those of Europe and America, and often ascends rivers, and in some places is acclimatised in fresh water. Yarrell says that Smelts have been kept for several years in ponds having no communication with the sea, without deteriorating either in size or flavour. It is remarkable for its cucumber-like odour, which becomes less powerful the longer the fish is kept out of water. As an article of diet, it is a fish of delicate and exquisite flavour. The average length is from eight to ten inches; the general colour is whitish, with green tints on the back and blue on the sides.

Smelting, the process by which metals are separated from their ores. It is conducted, in the case of copper, in reverberatory furnaces and, in the case of iron, in blast furnaces, and the object is to separate the solid impurities in the form of fusible slag and to dissipate other impurities by converting them into acids, which may either escape in the fumes or, when of value in themselves, recovered and saved by special treatment.

Smethwick, a town in the extreme south of Staffordshire, England, 3 miles W. of Birmingham. It is an industrial centre of great importance, having manufactures of glass, chemicals, lighthouse appliances, machinery, nuts, bolts, rivets and screws. The principal buildings include the public hall, free library, public baths and sessions court. Victoria Park, constructed in 1888, a fine open space of 36 acres, contains a lake. The Birmingham and Dudley and Wolverhampton Canals pass through the town. Pop. (1901), 54,560.

Smew. [MERGANSER.]

Smilax, a large and widely-distributed genus of tropical and sub-tropical climbing shrubs, the type of the sub-order Smilacæ of the order Lilacæ. They have generally fleshy rhizomes; prickly stems; cordate, irregularly net-veined glabrous leaves, with two stipular tendrils; small, polygamous flowers in globular clusters; and small baccate fruits. Sarsaparilla is obtained from the rhizomes of various species in different parts of the world. Several species are grown for ornament.

Smiles, SAMUEL, author, was born at Haddington, East Lothian, Scotland, on December 23rd, 1812, and was educated at Edinburgh University for the medical profession, which he ultimately abandoned for journalism, becoming editor of the *Leeds Times* in 1838. In 1845 he was appointed secretary of the Leeds and Thirsk Railway, in 1849 secretary of the Leeds Central Station Board, and in 1854 secretary to the South-Eastern Railway. In 1866 he exchanged the worry of railway routine for an easier post in an assurance company, but an attack of paralysis led him, in 1871, to retire from business pursuits altogether and to confine himself solely to literary work. In 1857 he had brought out his well-known *Life of George Stephenson* (of which more than 60,000 copies have been sold), to be followed by *Self-Help* (1859)—the sale of which has exceeded a quarter of a million copies,—*Lives of the Engineers* (1861), and *Industrial Biography* (1863). The fruits of his later labours have appeared in volumes on *The Huguenots* (1867), *Character* (1871), *Thrift* (1875), *Duty* (1880), *Life and Labour* (1887), besides his *Lives of Robert Dick the Thurso baker*, *Thomas Edward the working naturalist*, *George Moore the philanthropist*, *Jacques Jasmin the barber-poet*, and *John Murray the publisher*. He died in London on April 16th, 1904. His *Autobiography*, a somewhat poor and superficial work, evidently left until too advanced an age, was published in 1905. To a singular extent he illustrated in his own person the advantages of those practical virtues he never wearied in preaching to his fellow-creatures. He was accused of glorifying mere success, of ignoring the discipline of failure and the heroism that often underlies the endless struggle with adversity, and no doubt the man who "got on" attracted him. But he was never governed by unworthy motives or a sordid reverence for prosperity as such. In 1878 he received the degree of LL.D. from Edinburgh. The only one of his brothers who was the antithesis of much of his didactic exhortation, Robert Smiles, was, in spite of his failings, a cleverer and more gifted man.

Smirke, SIR ROBERT, architect, second son of Robert Smirke, was born in London on October 1st, 1781. Educated at Apsley School, Bedfordshire, he entered the schools of the Royal Academy in 1796, and was articled to Sir John

Soane. In 1801 he went to Italy, Sicily and Greece to study architecture and remained abroad until 1805. He was appointed architect to the Board of Trade in 1807 and in 1809-11 erected the Mint on Tower Hill. In 1823 his two most important works, the General Post Office in St. Martin's-le-Grand and the British Museum, were begun, the dignified façade of the latter building not being completed until 1847. Smirke was engaged on the restoration of York Minster after the fire of 1829 and among his other leading works are included the east wing of Somerset House; the College of Physicians, Trafalgar Square; the Carlton Club and Lowther and Eastnor Castles. He was knighted in 1832; in 1853 he was awarded the gold medal of the Royal Institute of British Architects; and in 1859 he retired to Cheltenham, where he died on April 18th, 1867.

Smith, ADAM, political economist, was born at Kirkcaldy, Fifeshire, Scotland, on June 5th, 1723, and was educated in the Grammar

School of his native town, Glasgow University, and Balliol College, Oxford, whither he had proceeded as Snell Exhibitioner. Returning to Kirkcaldy in 1746, he made the acquaintance of Lord Kames and David Hume, and, after some time spent in lecturing and desultory literary work, was appointed, in 1751, professor of Logic in Glasgow University, being transferred in the following year to the chair of Moral Philosophy in the same institution.

His lectures were thoughtful yet popular, and they are summed up in his *Theory of Moral Sentiments* (1759). In 1763 he accompanied the young Duke of Buccleuch and his younger brother Hew Campbell Scott on a foreign tour, and made the acquaintance of Helvetius, Turgot, Marmontel, D'Alembert, and Quémay, from the last of whom he is said to have imbibed certain economical doctrines. He had resigned his chair soon after setting out on his travels, which were abruptly terminated by the murder in Paris, in 1766, of his younger pupil, whose remains he at once brought home. He was elected F.R.S. in 1767. From 1766 to 1778 he remained with his mother at Kirkcaldy, engaged on his great work, *An Inquiry into the Nature and Causes of the Wealth of Nations* (published on March 9th, 1776), the foundations of which were laid during his professorial career. It is scarcely possible to overrate the influence this treatise has exercised on the world, though its effects were not

felt immediately. It established the law of supply and demand, made labour, not land or precious metals, the source of wealth, and paved the way for Free Trade. Smith, during several years, chiefly through occasional visits, had kept in touch with the best intellectual society of London, and in 1778 removed to Edinburgh as Commissioner of Customs. The Lord Rectorship of Glasgow University was conferred on him in 1787 to his great delight. He succumbed to a long and painful malady on July 17th, 1790, and was buried in the Canongate Churchyard in Edinburgh, where his grave is almost overlooked by the Roman tomb in Calton Cemetery which commemorates his warmest friend David Hume.

Smith, ALBERT RICHARD, novelist and lecturer, son of Richard Smith, surgeon, was born at Chertsey, Surrey, England, on May 24th, 1816. He was educated at the Merchant Taylors' School and at Middlesex Hospital to follow the profession of his father, whom he joined in 1838 at Chertsey, but in 1841 he came to London intending to practise. Inclination soon led him to abandon medicine for letters. He became a contributor to *Bentley's Miscellany* and to *Punch*, and in 1842 his first drama, *Blanche Heriot*, was produced at the Surrey Theatre, the earliest of a long series of successful plays and extravaganzas. In addition to many entertaining Natural Histories, songs and satirical sketches, he wrote several amusing novels. *The Adventures of Mr. Ledbury and his friend Jack Johnson*, which appeared in 1844, *The Fortunes of the Scattergood Family* (1845), and *Christopher Tadpole* (1848), are still deservedly popular. He went on a tour in the East in 1849, which resulted in the production of an entertainment, *The Overland Mail*, in May, 1850, which was the forerunner of the entertainment by which he became most widely known. On March 15th, 1852, *The Ascent of Mont Blanc* was produced at the Egyptian Hall, in London, with pictures painted by William Beverley. His sketches of Anglo-Continental life, interspersed with lively patter songs, "took the world by storm," and for some years continued to delight London. He made the mountain popular and originated that invasion of tourists which has banished solemnity from the valley and for whose convenience a railway traverses its entire length. In 1858 Smith went to Hong Kong, which also resulted in an entertainment, *China*. In 1859 he married Mary Lucy, daughter of Robert Keeley, the comedian, and on May 23rd, 1860, he died at Fulham. A memorial tablet in the English Chapel at Chamonix, placed there by his brother Arthur, associates his name with the village which they both loved so well.

Smith, ALEXANDER, poet and essayist, was born at Kilmarnock, Ayrshire, Scotland, on December 31st, 1830, and followed at first his father's trade of pattern-designer in a lace factory. However his strong literary tendencies



ADAM SMITH.

(From a medallion executed in the lifetime of Adam Smith, by Tassie.)

found expression in fugitive verses contributed to the *Glasgow Citizen*, and through the instrumentality of George Gilfillan he got permanent work. In 1853 appeared *A Life Drama and other Poems*, which made its author famous for a time as the chief exponent of what *Blackwood* named by way of ridicule the "Spasmodic School," and won him the post of secretary to the University of Edinburgh (1854). In 1855 he published *War Sonnets*, in conjunction with another rhapsodist, Sydney Dobell, and *City Poems* (1857), with *Edwin of Deira* (1861), added somewhat to his reputation. He next turned his hand to prose, writing *Dreamthorp* (1863), *A Summer in Skye* (1865), and *Alfred Hagart's Household* (1866), none of which was completely successful. He also edited for the Golden Treasury and Globe series of Messrs. Macmillan the *Poetical Works of Robert Burns*, which had a widespread and permanent vogue. His health, never very strong, broke down in 1866, and he died at Wardie, near Granton, in Mid-Lothian, on January 5th, 1867.

Smith, BENJAMIN ELI, lexicographer, son of Rev. Dr. Eli Smith, a Congregational missionary, was born at Beirut, Syria, on February 7th, 1857. After graduating at Amherst College, Massachusetts, he studied at Göttingen and Leipzig. In 1878 he became instructor in mathematics at Amherst College and, in 1881, in psychology at the Johns Hopkins University, Baltimore. Appointed managing editor of the *Century Dictionary* in 1882, he rendered important assistance in the preparation of that work, which may fitly be described as by far the most creditable example of scholarship, etymology, and lucid definition which the United States has produced. Smith revised and saw it through the press under the editor-in-chief, Professor W. D. Whitney, on whose death, in 1894, he became editor.

Smith, or Schmidt, BERNARD, commonly called **FATHER SMITH**, organ-builder, was born in Germany about 1630, and is believed to have learned his craft from Christian Former at Wettin, near Halle. Encouraged to settle in England, with a view to reviving organ-building, Smith came to London and was commissioned to build the organ for what was then the Banqueting Hall, Whitehall, and was also appointed organ-maker in ordinary to Charles II. Henceforward till his death, probably at Cambridge, in 1708, he was continuously engaged in his calling. He built the organs for Westminster Abbey (one, 1660), the cathedrals of Wells (1664), Durham (1683-91), St. Paul's (1694), Ripon, St. David's, Manchester (choir), and Chester. In Oxford he built organs for St. Mary's Church, Christ Church (1680), and the Sheldonian Theatre. In Cambridge he built organs for St. Mary's and the chapels of Pembroke, Emmanuel, Christ's, and Trinity Colleges (1708, on which he was engaged at his death). Amongst others of his organs were those for St. Martin's-in-the-Fields, St. Giles's-in-the-Fields, St. Peter's, Cornhill, St. Mary

Woolnoth, St. Clement Danes, St. James's, Garlickhithe, St. Dunstan's, Tower Street (afterwards removed to St. Albans Abbey), St. Katharine Cree, St. Olave's, Southwark, the Danish Church, Wellclose Square, Chelsea Old Church, and St. Nicholas, Deptford, in London; St. George's Chapel, Windsor; Eton College Chapel; Chapel Royal, Hampton Court; All Saints', Derby; St. Margaret's, Leicester; Hadleigh, Suffolk; Whalley, Lancashire, and the collegiate church of Southwell (now the cathedral). Special interest attached to the organ which Father Smith built for the Temple Church in London (1682-8) because of the efforts made to secure the commission for Renatus Harris (?1640-1715). The dispute was at last settled by an actual competition between the rivals, who both built organs within the church. As a result of tests, a joint committee confirmed the decision of the Middle Temple in favour of Smith's organ (June 2nd, 1685). It is said that though Harris's workmanship was the better, Smith's was the superior instrument in power and tone.

Smith, SIR FRANCIS PETTIT, inventor of the screw propeller for steamships, was born at Hythe, Kent, England, on February 9th, 1808, and educated at Ashford, Kent. He began life as a grazing farmer at Romney Marsh, but having since boyhood been keenly interested in boats and especially in the various means of propelling them, he devised a model driven by a screw, actuated by a spring, and became convinced that this form was superior to the paddle, then solely employed. He gave up farming entirely and devoted himself to the perfecting of his idea. A model, exhibited publicly in London in 1836, led to his fitting a 10-ton boat with a wooden screw and sailing her from Ramsgate to Dover and Hythe in 1837. The vessel behaved well in rough and smooth water. To satisfy the Admiralty the *Archimedes*, 237 tons, was fitted with a screw of one convolution and in 1839 was tried against the fast paddle-steamer *Vulcan* with successful results. But it was 1841 before the slow-moving Admiralty ordered the *Rattler*, the first war screw-steamer in the British Navy, to be laid down. She was launched in 1843, her trials were quite satisfactory and orders were given for 20 ships of war to be fitted with screws. The universal adoption of the screw was now but a question of time. Meanwhile Isambard Kingdom Brunel, who had seen the *Archimedes*, was so impressed with the soundness of the principle that he altered the *Great Britain*, the first large iron ocean-going steamer, from a paddle to a screw steamer. Smith was but poorly rewarded for his invention. In 1855 he received a pension of £200 and in 1857 a public testimonial of plate and a purse of £3,000 were presented to him. His fees as adviser to the Admiralty, however, being inadequate, he took to farming in Guernsey (1856), but lack of means obliged him in 1860 to accept the post of Curator of the

Patent Office Museum. In 1871 he was knighted and died at South Kensington, London, on February 12th, 1874.

Smith, GEORGE, publisher and founder of the *Dictionary of National Biography*, whose father was a native of Elginshire, was born in Fenchurch Street, London, where the firm of Smith and Elder then carried on their business, on March 19th, 1824. He was educated at Rottingdean, the Merchant Taylors' School, Blackheath and the City of London School, but being of an irrepressible disposition and not too amenable to scholastic discipline, his father took him into his office at the age of fourteen. At that date the banking department and agency for India and the East were much the most important branch of the concern, but young Smith soon evinced a special aptitude for publishing. The death of his father in 1846, followed as it was by the retirement of the other partners, threw an immense responsibility on George Smith, but he rose to the occasion and soon brought his firm into the front rank of publishers. Gradually his clients embraced the most eminent authors of the day, amongst them, John Ruskin, Charles Darwin, Leigh Hunt, George Henry Lewes, Charlotte Brontë, W. M. Thackeray, Harriet Martineau, Elizabeth Gaskell, Dante Gabriel Rossetti, Wilkie Collins, George Eliot, and the Brownings. With such a galaxy of talent at his command the success of George Smith's first great venture was assured. The *Cornhill Magazine* appeared on January 1st, 1860, under Thackeray's editorship, and at once obtained a circulation then without precedent in the annals of English periodicals. This magazine increased the roll-call of writers, which included Matthew Arnold, Fitzjames Stephen, Anthony Trollope, Dutton Cook, Charles Lever, Charles Reade, George Meredith, and Sir Theodore Martin. This made the launching of George Smith's second great project, an evening daily paper, comparatively easy, though it was a long time before the *Pall Mall Gazette*, of which the first number, under Frederick Greenwood's editorship, was issued on February 7th, 1865, happily named in allusion to Captain Shandon's paper in *Pendennis*, turned the corner financially. Interesting incidents in the publishing department were the appearance in 1867 of Queen Victoria's *Leaves from the Journal of Our Life in the Highlands* and the *Life of the Prince Consort* (1874-80), by Sir Theodore Martin. With such heavy undertakings on his hands, it is not surprising that George Smith gave up the agency and banking work of the firm of Henry S. King and Co. in 1868, and, in 1880, the *Pall Mall Gazette* to Henry Yates Thompson. The way was now clear for an enterprise of heroic proportions and of Imperial importance. This was the *Dictionary of National Biography*, the first volume of which was published in 1885 and the 63rd and last in 1900. At the completion of this unique work the Prince of Wales (after-

wards Edward VII.) attended the congratulatory dinner in May, 1900, and at the Mansion House on June 30th of the same year the Lord Mayor held a dinner in honour of the event, the dinner being attended by the foremost literary and public men of the day. Smith did not long survive these honours, dying at Byfleet, near Weybridge, Surrey, on April 6th, 1901. Outside of his business he was largely concerned in the company that owned the well-known Apollinaris mineral water.

Smith, GEORGE, Assyriologist, was born in Chelsea, London, on March 26th, 1840, and was apprenticed to learn bank-note engraving. His interest in the explorations of Sir Austen Henry Layard and Sir Henry Rawlinson at Nineveh and elsewhere constrained him to give all his spare time and money to the study of Assyrian subjects. Rawlinson and Dr. Samuel Birch, impressed by his intelligence, were instrumental in procuring his appointment as an assistant at the British Museum in January, 1867, and thenceforth he devoted himself to the pursuit of his favourite studies. In 1870 he was appointed senior assistant to Dr. Birch, the keeper of Oriental antiquities, and during 1871 he published one of his most important works, his valuable *Annals of Assur-bani-pal*. In 1872 Smith discovered, among the tablets which Layard collected, the *Chaldean Account of the Deluge*, by the translation of which he at once became famous. This led the proprietors of *The Daily Telegraph* to propose further researches at Nineveh, and Smith was granted leave of absence by the Trustees of the Museum. He started on January 20th, 1873, and succeeded in recovering the missing fragments of the story of the Deluge from the so-called "library" at Kouyunjik. The account of the expedition, *Assyrian Discoveries*, appeared in 1875, and when he had completed his translation of many other fragments relating to the Creation and the Fall, the results of his labours appeared in *The Chaldean Account of Genesis* (1876). The importance of his studies induced the Trustees to send him upon another expedition to complete the collection of tablets in the British Museum. He started in October, 1875, and after many vexatious delays, having at Bagdad obtained between two and three thousand tablets discovered by the Arabs in an ancient Babylonian library, he found it impracticable because of the unsettled state of the country to pursue his excavations at Kouyunjik. Exhausted by fatigue and anxiety after a brief illness he died at Aleppo, on August 19th, 1876. A public subscription was promoted by Professor Sayce for his widow, to whom, in consideration of George Smith's eminent services to Biblical research, a civil list pension was granted.

Smith, GOLDWIN, historian and publicist, was born at Reading, Berkshire, England, on August 13th, 1823. Coming up to Oxford from Eton, he carried off all the chief prizes, and was elected to a fellowship at University Col-

lege, and afterwards to an honorary fellowship at Oriel. He was called to the bar and acted as secretary to the University Commissions of 1850 and 1854, and to that on Popular Education (1858). In this year he was made Regius Professor of Modern History at Oxford, holding the chair until 1866. During the War of Secession in America he stood forth as a fervent Abolitionist and champion of the North, and at the end of the struggle (1864) went on a lecturing tour throughout the United States. In 1868 he accepted a professorship of English and Constitutional History in Cornell University, New York, but three years later settled at Toronto, Canada. Here he edited the *Canadian Monthly* and founded the *Week* and the *By-stander*. As a politician, he early evinced an interest in Radical principles from which he never receded throughout his long career. As a writer, his brilliance is well balanced by sanity and thoughtfulness. Among his best-known works were his pamphlets on *Does the Bible Sanction American Slavery?* (1863) and *The Reorganization of the University of Oxford* (1868), and his books, *Canada and the Canadian Question* (1891), *The United States: An Outline of Political History* (1893), *Essays on Questions of the Day* (1894), *Guesses at the Riddle of Existence* (1897), *The United Kingdom: a Political History* (1899), and *Commonwealth or Empire?* (1902). In the last-named work he warned the United States against the assumption of Imperial responsibilities, while in the first-named he showed that the manifest destiny of the Dominion was amalgamation with the United States, so that the Anglo-Saxon peoples of North America might constitute one single, grand, united commonwealth, standing "four-square to all the winds that blow."

Smith, SIR HARRY GEORGE WAKELYN, general and administrator, was born at Whittlesea, Cambridgeshire, England, in 1787, and entered the army in 1805. After taking part in the operations at Monte Video and Buenos Aires in 1806 and 1807, he was present at the battle of Corunna in 1809. He fought throughout the whole of the Peninsular War, saving after the storming of Badajoz (1812) the young Spanish girl who afterwards became his wife. He was present at the burning of Washington and the unsuccessful attack on New Orleans (1814), but peace was declared in time to enable him to share the dangers and glories of Waterloo. After service at home for several years he was despatched to Jamaica in 1826 as Quarter-master-General of the Forces and, in 1828, to the Cape of Good Hope in a similar capacity. In 1834 and 1835 he was occupied in putting down Kaffre risings in different parts of South Africa. From the Cape he proceeded to India, and for his services at the battle of Maharajpur (1843) was made K.C.B. In 1845 and 1846 he was in the thick of the fighting against the Sikhs and at Aliwal (January 28th, 1846) and Sobraon (February 10th) displayed consummate bravery and generalship and was promoted major-general, created a baronet and

awarded the G.C.B. In 1847 he was appointed Governor of the Cape of Good Hope. His difficulties were great, but he surmounted them one by one, defeating the Boers at Boom Plat in 1848, ultimately prevailing upon the Home Government not to make the Cape a convict settlement against the wishes of its people (1850) and crushing the Kaffres in a concerted attempt at rebellion (1850-2). He was, however, superseded in April, 1852, on the ground of dilatoriness—an extraordinary plea, since it was foreign to the whole tenor of Sir Harry's conduct on the battlefield in much more serious campaigns. He was one of the pall-bearers at the Duke of Wellington's funeral in 1852. In 1853 he was appointed to the command of the Western military district and the Lieutenant-Governorship of Plymouth, and in 1854 was promoted Lieutenant-General and transferred to the Northern command with headquarters at Manchester. He died in London on October 12th, 1860. The South African towns of Harrismith (Orange River Colony), Ladysmith (Natal, famous for its gallant defence under Sir George White in the Boer War), and Aliwal (Cape Colony) commemorate Smith's services to the Cape.

Smith, HENRY JOHN STEPHEN, mathematician, son of John Smith, an Irish barrister, was born in Dublin on November 2nd, 1826. At four he taught himself some Greek and until the age of twelve was entirely educated by his accomplished mother, who had been left a widow in 1828. In 1841 he went to Rugby; in 1844 he won the Balliol scholarship and after studying in Rome and Paris resumed his career at Oxford in 1847. He took a double-first class; was elected Fellow of Balliol in 1849 and in 1851 gained the senior mathematical scholarship. He became Savilian Professor of Geometry in 1860 and was for many years a member of the Hebdomadal Council. Professor Huxley thought he would have been one of the greatest men of his day if, added to his wonderful intellect, he had been ambitious. But work for which he was supremely fitted was neglected for duties which filled his time and which others could have performed equally well, so that his intimates often failed to realise his capacity. He projected a treatise on the Theory of Numbers and his preliminary studies were embodied in his masterly *Report*, presented to the British Association in six parts from 1859 to 1865. In 1882 the French Academy, ignorant of his work and how far his researches had gone, set the demonstration and completion of Eisenstein's theorems for five squares as the subject for their Grand Prix des Sciences Mathématiques. Requested by a member of the committee which proposed the prize he undertook to write out the demonstration. His health having suffered through overwork, Smith died unmarried, on February 9th, 1883, and two months later the prize of 3,000fr. was awarded to him. His *Collected Mathematical Papers* was issued in 1894 with

biographical notices by Dr. C. H. Pearson and others.

Smith, HORATIO (though he was always known as **HORACE**), poet and novelist, was born in London in 1779, and educated with his elder brother, **JAMES SMITH** (born in London on February 10th, 1775), at a school in Chigwell. James entered the office of his father, a solicitor, whom he succeeded as Solicitor to the Board of Ordnance, and Horace was placed in a merchant's counting-house. In 1812 a prize was offered for a poem, to be recited at the opening of the new Drury Lane Theatre, and the Smiths conceived the happy idea of writing parodies of the styles of contemporary poets, and publishing them in a volume entitled *Rejected Addresses*. James took, amongst others, Wordsworth, Southey, Coleridge, and Crabbe, whilst Byron, Moore, Scott, and Bowles, with others, fell to the share of Horace. The venture proved an immense success and was so gracefully undertaken as to hurt nobody's feelings. James never made any subsequent attempt to add to his fame, beyond supplying the libretto for some of Charles Mathews's comic entertainments, and died in London on December 24th, 1839. Horace earned a fortune on the Stock Exchange, and then essayed to fill Sir Walter Scott's place as historical novelist. Out of a score of his romances *Brambletye House* (1826) alone survives. Of his later poetical effusions, serious as well as humorous, only "An Address to a Mummy" approaches the standard of the work that made him and his brother famous. He died at Tunbridge Wells, Kent, on July 12th, 1849.

Smith, JAMES, usually styled **SMITH OF DEANSTON**, inventor, was born in Glasgow on January 3rd, 1789, and educated at Glasgow University. At the age of eighteen he was given charge of the cotton mills at Deanston on the Teith, near Doune, in Perthshire. He at once reorganised the concern and saved it from collapse. He next essayed to invent a reaping-machine, but though his models of 1811 and 1813 were ingenious and attracted great attention they were not adopted by farmers. Soon after coming into his farm at Deanston he deep-drained it throughout, but the partial failure of his system led him to invent the subsoil plough by means of which the deeper-lying barren ground was broken up and fertilised without being intermixed with the richer soil above it. The process of deep-ploughing and thorough draining came to be known as "Deanstonising." The report of his successful conversion of worthless land into a fertile garden drew visitors from all quarters of Europe and the United States. Among his other inventions were the turn-wrest plough, the web-chain harrow, an improved self-acting mule and the salmon-ladder on the Teith to enable the fishes to ascend the river, the weir which he had constructed to increase the water-power of his factory having prevented the pas-

sage of the salmon upstream. He left Deanston suddenly in 1842 and established himself in London as an agricultural engineer, and was largely employed as a land valuer during the railway mania of 1844 and 1845. He died at Kingencleuch, Ayrshire, on June 10th, 1850.

Smith, SIR JAMES EDWARD, botanist, was born at Norwich, Norfolk, on December 2nd, 1759. Being delicate he was educated at home and inherited from his mother a great love of flowers. He studied medicine at Edinburgh, where he gratified under Dr. John Hope his strong bent towards botany, and in London. In 1783 he purchased the library, manuscripts, herbarium and natural history collections which had belonged to the illustrious Linnæus, and two years later was elected F.R.S. In 1788 he was instrumental in founding the Linnean Society, which held its first meeting on April 8th of that year and elected Smith its first President, a post to which he was annually re-elected as long as he lived. In 1790 he began the publication of his *English Botany* (often called Sowerby's after James Sowerby, its illustrator), the last volume of which (there were 36 in all) appeared in 1814. Though this is likely to be his most enduring work, the most successful was his *Introduction to Physiological and Systematic Botany*. In 1814 he was knighted when the Prince Regent became patron of the Linnean Society. In 1818 the governing body of Cambridge University refused to allow him to take the botany class during the illness of Professor Thomas Martyn (1735-1825) because he was a Unitarian. The last seven years of his life were occupied with *The English Flora* (4 vols., 1824-8). He died at Norwich on March 17th, 1828. His widow, **LADY PLEASANCE SMITH** (born at Reeve, Lowestoft, on May 11th, 1773), survived him forty-nine years, dying in Lowestoft on February 3rd, 1877. She retained her faculties to the last and was not enamoured of the past as a matter of course. When the tendency of modern science was discussed in her hearing, her invariable answer was, "I am for inquiry."

Smith, JOHN, captain, colonist and adventurer, son of George Smith, a farmer, was born at Willoughby, Lincolnshire, in 1580, and became a scholar in the free schools of Alford and Louth. On his father's death in 1596 he went with the second son of Lord Willoughby to France and began soldiering under Henri IV. at Havre; but peace being made with Spain, in 1598, he offered his services to the insurgents in the Low Countries. In 1600 he returned home, studied the theory of war, and again sought service abroad, where he encountered many surprising adventures which are believed to contain a substratum of fact. He was thrown overboard and rescued by pirates; he fought the Turks, killing three of their champions in a series of combats in sight of the contending forces. He was sold for a slave and sent to Constantinople where, beloved by a

Turkish lady of quality, he found a protector. After killing his master he escaped and ultimately conveniently falling in with an English man-of-war came home in 1605. On December 19th, 1606, he started from Blackwall with other fellow-emigrants to found the colony of Virginia, the second expedition which had left England for that purpose. They anchored in Chesapeake Bay on April 30th, 1607, but discovered no trace of the earlier colonists, sent by the Virginia Company of London, who probably had been exterminated by Indian tribes. In April they founded Jamestown, having made friends with the natives. Having little liking for tillage they depended for food upon such supplies as they could buy, or beg, or steal. Smith proved a successful leader, but in one of their explorations they were surprised by the Indians and after a brave defence he was taken captive and led about the country for a wonder. Powhattan, the king, afterwards decided he should be executed. In the romantic account he wrote for Queen Anne, consort of James I., Smith says that his head was laid upon two great stones. "And being ready with their clubs to beat out his brains, Pocahontas, the king's dearest daughter, when no entreaty could prevail, got his head in her arms and laid her own upon his to save him from death." Whereat he was spared to make them hatchets and bells and other things. In September, 1608, he became head of the colony and succeeded in introducing order and industry among the thriftless colonists, but when, during the following year, another party arrived from home and dissensions arose Smith, who had been seriously injured by an accident, left Virginia never to return. In 1614 he visited the territory to which Prince Charles at his suggestion gave the name of New England, and the last years of his life were chiefly devoted to authorship. *The Generall Historie of Virginia, New England, and the Summer Isles, together with the True Travels, Adventures, and Observations and a Sea Grammar*, by Captain John Smith, are well known and were reprinted in the year 1906. Whatever doubt has been suggested by his own record of his exploits, the credit of having laid the foundation of the prosperity of the settlement of Virginia is chiefly due to him. He died in London on June 21st, 1631, and was buried in St. Sepulchre's Church. La Belle Sauvage, the princess Pocahontas, became a convert to Christianity and was christened Rebecca. She was married to John Rolfe on April 5th, 1613, and, in 1616, with her husband and child, visited England, where she renewed her acquaintance with the adventurous captain. As she was about to return to America she died in March, 1617, at Gravesend, where she lies buried in the chancel of St. George's Church.

Smith, JOHN, Platonist, was born at Achurch, near Oundle, Northamptonshire, in 1618. He entered Emmanuel College, Cambridge, in 1636 as a pensioner, his tutor being Benjamin

Whichcote, who befriended him. In 1644, with seven other members of his college, he was transferred to Queens' College, the Assembly of Divines sitting in Westminster having examined and approved them "as fitt to be fellows." There he lectured on mathematics and Hebrew, was Greek Prælector and became Dean of his college in 1650. One of the rising school of Cambridge Platonists, he became known as a "living library," praised not only for being just and upright in his conversation, but for his learning and humility. After a long illness, patiently endured, he died of consumption on August 7th, 1652, and was buried in his college chapel, the funeral sermon being preached by his warm admirer, Simon Patrick. His *Select Discourses*, which are distinguished by their refined thought and ability, were published in 1660 and have often been reprinted.

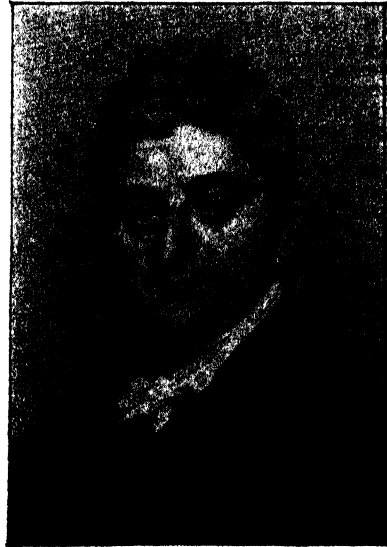
Smith, JOSEPH, founder of the body known as Mormons, son of a farmer, was born at Sharon, Vermont, United States, on December 23rd, 1805. The family removed to Manchester, State of New York, in 1819, where a "revival" took place and Joseph, during the excitement it produced, declared he had seen a vision of two Divine Persons who instructed him that all the sects then known were in error. His story met with ridicule and for some years he spent a discreditable life. On September 21st, 1823, another vision was vouchsafed which, he said, "called me by name" and told him of a book "written upon golden plates, . . . that the fulness of the everlasting gospel was contained in it" and revealed where these records lay concealed. From this time he professed to receive frequent messages from heaven. Four years later an angel delivered the records into his hands and by means of "the Urim and Thummim," transparent stones resembling a pair of spectacles, he was able to translate from an unknown tongue, which he called the Reformed Egyptian, certain remarkable hieroglyphics into English. Seated behind a blanket, to screen the plates from unholy eyes, Smith dictated the translation to Martin Harris, a credulous person with property, who when it was eventually finished sold his farm, in obedience to revelation, to bear half the cost of printing it. *The Book of Mormon* was published in 1830, with a preface, signed by Harris and two other followers, stating that an angel had shown them these remarkable plates. The work was really written in 1809 by a *quondam* minister, Solomon Spaulding, but it is not clear how Smith obtained the MS., which was subsequently recognised by its author's widow. "The Church of Christ" was formally started in La Fayette, on April 6th, 1830, with six members, and at the first conference in June thirty members assembled. Missionaries were sent forth and one of the early converts was Brigham Young, Smith's successor. Their affairs were entirely directed by revelation, which the profane regarded as a

cloak for Smith's greed. Despite persecution and ridicule the sect increased rapidly. The scandal caused by schisms and doubtful commercial dealings led in 1838 to their being expelled from Missouri. They then settled in Illinois where, in 1839, they founded the city of Nauvoo, explained as Hebrew for "beautiful." A mansion was built for the Prophet and his family, who were maintained at the public cost, and revelation further directed the erection of a splendid temple for the worship of the Church of Jesus Christ of the Latter-day Saints, the title adopted in 1834. Smith was often tried on charges of swindling and inciting to murder and always acquitted. With his chief followers he began secretly to teach polygamy. Their enemies then established a paper in Nauvoo which in its first number printed affidavits from women who declared that he and other leaders had attempted to seduce them. The Saints rejoined that the paper was a public nuisance, which was ordered to be abated. The mob forthwith destroyed the office and its plant. A warrant against the Prophet as instigator of the riot was issued by the Governor of the State. At first he resisted it, but on the Governor pledging his honour they should be protected Smith and his brother Hyram surrendered and were lodged in the prison at Carthage. When it was rumoured that the Governor was ready to connive at their escape a band of men disguised as Indians broke into the prison on June 27th, 1844, overpowered the guard and shot the Smiths dead. The character of Joseph Smith, who left a widow and several children, forbids the excuse that he was a misguided enthusiast. His death did not ruin the sect. Young was unanimously elected president and under him they left Illinois in 1846 and settled, guided, they said, by an angel, in the Valley of the Great Salt Lake, where, in 1852, the "Celestial Law of Marriage" was promulgated and at once adopted.

Smith, ROBERT, mathematician, son of John Smith, was born in 1689. He was educated at Leicester Grammar School and in May, 1708, admitted a pensioner at Trinity College, Cambridge, where he was under the care of his cousin, Roger Cotes, Plumian Professor of Astronomy, whom he succeeded in 1716, retaining the professorship until 1760. In 1738 he published *A Compleat System of Opticks* (which gained him the nickname of "Old Focus") dedicated to Sir Edward Walpole, with whose help the work was started and completed. The observatory over the great gate of Trinity College was finished under his direction and the telescope, described in his *Opticks* and often shown as Sir Isaac Newton's, was made for him. He succeeded Bentley as master of Trinity College on July 20th, 1742, and acted as Vice-Chancellor of the University in 1742-3. He died, unmarried, on February 2nd, 1768, and was buried in his college chapel. Besides editing Cotes's *Lectures*, he wrote a

valuable work entitled *Harmonics, or the Philosophy of Musical Sounds* (1749), which he dedicated to his pupil, the Duke of Cumberland. He loved music; his acts of kindness were numerous; his benefactions both to his college and to the University were munificent. The Smith's prizes, by which his name lives, now amount to £23 each and have "enabled the University to encourage some of the higher branches of mathematics."

Smith, SYDNEY, Canon of St. Paul's Cathedral, was born at Woodford, Essex, England, on June 3rd, 1771. He became captain of Winchester, and entering New College, Oxford, obtained a fellowship and drifted into the Church, although his own preference was for



REV. SYDNEY SMITH.

Law. After holding a curacy at Nether Avon, on Salisbury Plain, he went to Edinburgh as a private tutor in 1798, there met Francis Jeffrey, and joined him, Henry Brougham, and other advanced Whigs in founding the *Edinburgh Review*, the first issue of which he edited in 1802. He had now established his reputation as a thinker of independent views, a brilliant writer, and above all, a wit of the keenest, yet most genial order. He came to London in 1802 (he had married happily two years before), figured for a while as a social lion and a popular preacher at the Foundling Hospital and Fitzroy and Berkeley Chapels, and a lecturer—his courses on Moral Philosophy at the Royal Institution in 1804, 1805, and 1806 became the feature of London Society,—and in 1806 accepted the living of Poston-le-Clay, in a desolate part of Yorkshire. In 1807 he published anonymously *Peter*

Plymley's Letters, which did much to pave the way for Catholic Emancipation. In 1828, Lord Lyndhurst, though a Tory, presented him to a canonry at Bristol and a living at Combe Florey, near Taunton, but it was not until 1831 that his party got into power, and then he received a prebendal stall at St. Paul's. The premature death of his eldest son was a cruel blow, but the marriage of his daughter with Sir Henry Holland added much to the happiness of his later years. He died in London on February 22nd, 1845. Till the advent of Lord Macaulay in 1825 he was one of the mainstays of the *Edinburgh Review*. As an essayist, he wrote a singularly clear, strong style, free from affectation and mannerisms, while his numerous witty sayings and his famous comparison of the House of Lords to "Dame Partington trying to mop back the Atlantic" will be lasting ornaments of English literature. With incomparable courage he denounced inhumanity, lashed vice and scourged hypocrisy. Not only happy himself but the cause of happiness in others, he yet hated evil all his days and was a fervent lover of justice and the very personification of common sense. Wise, longheaded, logical, he was the confidant and adviser of statesmen, but it was a real misfortune that Society, fascinated by his shining conversational and other amiable gifts, made so much of him, for he must otherwise have proved a great public moral force.

Smith, WALTER CHALMERS, poet and divine, was born in Aberdeen on December 5th, 1824, and was educated at Aberdeen and in Edinburgh University. After his ordination he became minister to a Presbyterian congregation in London and afterwards was appointed to the Free Church at Orwell, Kinross-shire. He then held charges in Edinburgh and Glasgow and later returned to Edinburgh as minister of the Free High Church. An admirable preacher and an accomplished man he gained a wide reputation by his stories in verse, thoughtful poems distinguished by much lyrical and imaginative beauty. *The Bishop's Walk* was published in 1861 under the name of "Orwell"; the well-known *Olrig Grange*, by "Hermann Kunst," appeared in 1872, and his later volumes include *Hilda among the Broken Gods*, *Raban, North-Country Folk*, *Kildrostan, Thoughts and Fancies for Sunday Evenings*, and *A Heretic*.

Smith, WILLIAM, the father of English geology, the son of John Smith, was born on March 23rd, 1769, at Churchill, Oxfordshire. Educated at the village school, as a boy of studious habits he began collecting fossils, taught himself geometry and gained sufficient experience to become assistant to Edward Webb of Stow-on-the-Wold, a self-taught surveyor. Under Webb he acquired a knowledge of soils and the underlying rocks of the district and neighbouring counties, so that in 1793 he was able to undertake the survey of a canal through the Somerset coalfield. This led him to pursue

the study of the English strata and the mastery thus derived of scientific principles, and his success in dealing with questions of drainage and water, provided him with the means to prepare a map of the strata of England and Wales. He obtained almost a monopoly of irrigation work, which often necessitated his travelling ten thousand miles yearly in days before railroads had covered the land. He removed his geological collection to London in 1805. Ten years later his great work was completed. The *Map* was published on August 1st, 1815, and from "that hour the fame of its author as a great original discoverer in English geology was secured." But it cost him all he had earned and pecuniary difficulties obliged him in 1819 to sell everything he possessed. His wife's health failed, and to crown his distress in 1820 her mind became affected. For some years he had no regular home, but accompanied by his nephew, John Phillips, he moved about wherever his duties or investigations required. In February, 1831, the Geological Society voted him the first Wollaston medal awarded. The Government granted him a pension of £100 a year, and, in 1835, when the British Association visited Dublin he received the honorary degree of LL.D. from Trinity College. He died at Northampton on August 28th, 1839, admirable alike for his patience, for the ingenuity of his contrivances for overcoming difficulties and for the generosity with which he imparted to others the knowledge he had laboriously acquired.

Smith, SIR WILLIAM, lexicographer, was born at Enfield, Middlesex, England, in 1813, and took high classical honours at University College, London. Whilst reading for the bar he engaged in literary work for the famous house of John Murray, and in 1842 published the *Dictionary of Greek and Roman Antiquities*. This was followed, in 1849, by the *Dictionary of Greek and Roman Biography* and, in 1857, by the *Dictionary of Greek and Roman Geography*. These monumental works did not exhaust his energies, for he also brought out a school dictionary of Latin and classical textbooks, and started, in 1853, the "Principia" series and the series of Student's Manuals of History and Literature, to which he contributed the volume on Greece (1854). Then he went back to lexicographical work on the major scale and produced, in 1860-5, the *Bible Dictionary*, in 1875-80, collaborating with Archdeacon Cheetam, the *Dictionary of Christian Antiquities* and, in conjunction with the Rev. Dr. Henry Wace, the *Dictionary of Christian Biography* (1877-87). He found time, moreover, to act as classical examiner (1853-69) and member of the Senate of the London University, to prepare an edition of Gibbon (1854-5), and to supervise the great *Atlas of Biblical and Classical Geography*, which appeared in 1875. He became editor of the *Quarterly Review* in 1867, and maintained the high literary and intellectual traditions of

that periodical until his death in London on October 7th, 1893. He was D.C.L. of Oxford and Dublin, LL.D. of Glasgow, Ph.D. of Leipzig, and, in 1892, received the honour of knighthood.

Smith, WILLIAM HENRY, statesman, was born in London on June 24th, 1825, and educated at Tavistock Grammar School. He desired to study for the Church, but yielded to his father's wish and entered the news-agency in the Strand. He became a partner in 1846 and the style of W. H. Smith and Son became as familiar as a household word. In 1851 he acquired the bookstalls on the London and North-Western Railway, a system of bookselling which he initiated, and soon afterwards obtained a like monopoly on the other great trunk lines. He was also a pioneer in the exhibition of open-air advertisements on walls and hoardings and afterwards added a circulating library department to his business, now grown colossal and coining money rapidly. In 1868 he turned his attention to politics, ousted John Stuart Mill from the representation of Westminster, and held the seat continuously until his death. A man of prodigious industry and unimpeachable integrity, he soon made himself of use to the Conservative party, and held office from 1874 to 1880 as Financial Secretary to the Treasury and First Lord of the Admiralty. On the return of his party to power in 1885 he went to the War Office, and, subsequently, for a few days, to the Irish Office. When Lord Salisbury formed his second Cabinet in 1886, Mr. Smith resumed the War Office, which he exchanged soon afterwards, on the resignation of Lord Randolph Churchill, for that of First Lord of the Treasury and Leader of the House. In 1891 his constitution broke down, and he died on October 6th, 1891, at Walmer Castle, near Deal, his residence as Warden of the Cinque Ports, an office to which he had been appointed five months before. His wife was created Viscountess Hambleden on November 10th, 1891, with remainder to her husband's heirs. It is said that W. H. Smith was inclined towards Liberalism, but was driven into the Tory ranks by his rejection as a candidate for membership of the Reform Club in 1862, on the alleged ground that he was a tradesman.

Smith, WILLIAM ROBERTSON, Biblical critic, was born on November 8th, 1846, at Keig, Aberdeenshire, where his father, the Rev. William Pirie Smith, was minister of the Free Church. Educated at first at home, he went to Aberdeen University in 1861, where he had a brilliant career. He subsequently studied theology in Edinburgh, Bonn and Göttingen. In 1870 he was elected Professor of Oriental Languages and Old Testament Exegesis in the Free Church College, Aberdeen. Pupil and friend of many of the German advocates of the higher criticism, his teaching ultimately aroused the heresy hunters in the General Assembly of the Free Church. A committee

reported adversely upon his writings on Biblical subjects in the ninth edition of the *Encyclopædia Britannica*, and a prosecution for heresy followed. Smith was acquitted, but consequent upon an article which appeared in that *Encyclopædia* in June, 1880, on "Hebrew Language and Literature" he was removed from his Chair in 1881. He then joined Professor Spencer Baynes in the editorship of the *Encyclopædia Britannica*, and on Baynes's death became editor-in-chief. In 1883 he was appointed Lord Almoner's Professor of Arabic at Cambridge, where from that time he made his home. Elected Fellow of Christ's College in 1885 he, in 1886, became University Librarian, which office he exchanged for the Adams Professorship of Arabic. After some years of suffering, courageously borne, he died at Cambridge on March 31st, 1894, and was buried at Keig. Impatient of stupidity, eloquent, and famous for the range of his learning, the sweetness of his disposition endeared him to a wide circle of friends.

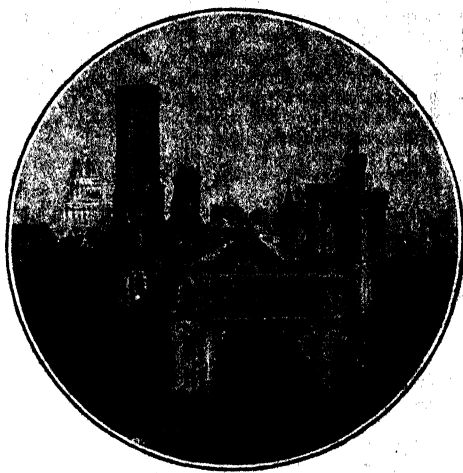
Smith, SIR WILLIAM SIDNEY, usually styled **SIR SIDNEY SMITH**, admiral, was born at Westminster on June 21st, 1764, and was educated at Tonbridge and Bath. He entered the navy in 1777, and for his courage in Rodney's action off Cape St. Vincent got his lieutenancy in 1780, becoming a captain after many gallant services at the age of eighteen. From 1789 to 1792 he was naval adviser to the King of Sweden, who made him a knight, George III. formally investing him at St. James's Palace on Smith's return to England. Sent on a mission to Constantinople, he joined Lord Hood off Toulon and volunteered to burn the French fleet, a duty which, despite his loud assertions, was afterwards found to have been carried out in a very perfunctory manner. In 1796 he was taken prisoner whilst operating against privateers in the Channel and passed two years in the Temple prison, in Paris, from which he made a romantic escape in 1798. Next year he forced Napoleon to raise the siege of Acre, and was wounded at Alexandria, where he served as a brigadier under Sir Ralph Abercromby (1801). Returning to England, he received many honours and rewards, and was elected M.P. for Rochester (1802). In 1814 his career practically came to an end. He was made K.C.B. in 1815, promoted admiral in 1821, and created G.C.B. in 1838. During most of his later years he resided in Paris, where he died on May 26th, 1840. Although his courage and energy were undoubted, he was vain-glorious and boastful and embroiled himself with Lord Nelson and even with the Government through disobedience inspired by conceit.

Smithfield, or **SMOOTHFIELD**, which would seem to be its correct name, a district of London, immediately north of Newgate Street, west of Aldersgate, south of Clerkenwell and east of Farringdon Street. It is now occupied by the great Metropolitan Meat Market and the necessary open space in front of it

utilised as a hay market, the famous Hospital of St. Bartholomew, Cloth Fair and the fine old church of St. Bartholomew the Great. From the 12th century it was the scene of jousts and tournaments promoted by the kings, and was the recreation ground where the 'prentices and others played bowls and football and followed archery and other sports. Until the gallows was erected at Tyburn it was the place of public execution, the most illustrious victim of the law being Sir William Wallace, who was hanged here in 1305 before being drawn and quartered. Here, too, on June 15th, 1381, Wat Tyler, at the head of 30,000 insurgent peasants, was stabbed to death by Sir William Walworth, Lord Mayor of London, in the presence of Richard II. It was resorted to for purposes of duels and the superstitious ordeal by battle, and miracle plays were performed here before the days of theatres. During the reigns of Henry VIII., Mary, and Elizabeth, martyrs—victims now of Catholic and now of Protestant bigotry and cruelty—were burned at the stake. For fully seven centuries it was annually the scene of the notorious Bartholomew Fair which, originating as a *bond-fide* fair of three days' duration, ultimately developed into a fortnight's saturnalia which became the scandal and disgrace of the metropolis and was finally stopped in 1850. It was the great market for cattle, sheep, horses and pigs almost from the period of the Conquest until 1855, when the cattle market was removed to a more commodious and much more suitable site in Islington. It was after this removal that the markets for the sale of butcher meat and poultry were erected, with fish and vegetable markets adjoining on the west. St. Bartholomew's Hospital, founded in 1123 by Rahere, a monk and ex-jester of Henry I., in course of time became the foremost medical school in London, and the church of St. Bartholomew the Great contains some beautiful examples of Norman work. At the south-west of Smithfield are Pie Corner, where the Great Fire of 1666 ceased its ravages, and Cock Lane, which was haunted by the ghost in which Dr. Johnson is usually though erroneously supposed to have been a believer. EAST SMITHFIELD, east of the Tower and the Mint, is now largely occupied by St. Katharine's and London Docks and warehouses, but was comparatively rural as late as the Civil War, for it is recorded that in 1629 Charles I. killed a stag here.

Smithsonian Institution is a scientific foundation established at Washington, United States, in 1846. The history of its origin is this:—James Smithson (1765-1829), natural son of the first Duke of Northumberland of the third creation, was a graduate of Pembroke College, Oxford, where he was distinguished for his attainments in chemistry, became in 1787 F.R.S., and associated with the men of scientific note of the day. After a life of travel, he died at Genoa, and left a large property to his nephew, with reversion, in default of direct

heirs, to the United States, "to found at Washington, under the name of the Smithsonian Institution, an establishment for the increase and diffusion of knowledge among men." Thus,



SMITHSONIAN INSTITUTION, WASHINGTON, U.S.A.

(Photo Stereograph. Copyright: Underwood, Underwood.)

in 1837, the United States Treasury inherited £104,960, and the interest on this enabled them to start the Institution on a liberal scale, the Union Government having generously reinforced the income by many grants. The Institution is controlled by a board of regents of whom the President of the United States is, *ex officio*, head. It concerns itself with exploration and research in zoology, ethnology, geology, geography, astronomy and other branches of science, and issues, in quarto, *Smithsonian Contributions to Knowledge*, and, in octavo, *Miscellaneous Contributions*, in addition to Annual Reports, Bulletins and Proceedings. It is housed in one of the finest buildings in Washington, and founded the National Museum, an Astrophysical Observatory, Zoological Park, and a Library, besides accommodating the library of Congress. When, in 1903, the cemetery in Genoa was demolished owing to municipal improvements, Smithson's remains were delivered over to the United States and re-interred in Washington in 1904.

Smoke is usually a gaseous current conveying solid particles in a fine state of division. If a piece of zinc be heated strongly in the air, it will catch fire and burn with a brilliant bluish flame, evolving dense clouds of white smoke. This smoke is of the simplest kind. It consists of zinc oxide—often known as zinc white—which is carried upwards by the heated air. The smoke from burning fuel is of a more complex nature, although carbon in the form of soot is often present in large quantities, as Londoners in the season of fog, especially in

November, know to their cost. This is accompanied by carbon dioxide, oxygen, nitrogen, and, sometimes, carbon monoxide. In big towns the escape of vast quantities of smoke into the atmosphere is considered as a nuisance, and is punishable by fine. Such an escape of smoke shows, however, that the fuel is not being consumed economically, so that it is to the consumer's interest to prevent it. To this end furnaces are supplied with special arrangements for regulating both the supply of fuel and of air to the fire-place.

Smolensk, a government of Central Russia, bounded on the N. by Pskoff and Tver, on the E. by Moscow and Kaluga, on the S. by Orel and Tchernigoff, and on the W. by Moghileff and Vitebsk. It covers an area of 21,624 square miles. The surface is hilly in the north and west, but in the south and east it declines towards a great plain. Watered by the Dnieper, Dwina, Gzhat, Oka, and other rivers, its soil is very fertile, and yields heavy crops of rye, oats, barley, wheat, potatoes, hemp, flax, hops, and tobacco. The live-stock comprises horses, cattle, sheep, and pigs, all raised in large numbers. The industries include distilling, paper-making, cotton-spinning, and the making of agricultural implements. The capital, **SMOLENSK** (57,405) is situated on the Dnieper. The Uspenski Cathedral (Church of the Ascension) contains the picture of the Virgin brought to Russia in 1046. It is ascribed to the evangelist Luke and is regarded with general veneration. Other buildings are the public libraries, anti-quarian museum, and a people's palace. There are monuments commemorative of the composer Glinka and the war of 1812, when the town was seized by the French and suffered greatly both from fighting and flames. It is one of the oldest towns in Russia, was formerly a principality, was taken by Sigismund III. of Poland in 1611, recaptured by Russia in 1654 and finally annexed to the empire in 1686. Pop. of province (estimated), 1,800,000.

Smollett, **TOBIAS GEORGE**, novelist, the younger grandson of a Scots law lord, was born at Dalquhurn, Dumbartonshire, in 1721. He was educated at the Grammar School of Dumbarton and, amidst some hardships, studied at Glasgow University for the medical profession. His grandfather, dying, left him penniless at the age of eighteen, and he came up to London with his tragedy *The Regicide*, but took the post of surgeon's mate in the navy, serving until 1744, when he resolved to seek a livelihood in literature. His first ventures, *Advice and Reproof*, two satirical poems, found a publisher, but his plays were rejected, and he and his wife, a creole beauty, the daughter of an English planter, were reduced to cruel straits. In these circumstances he wrote *Roderick Random*, which appeared in 1748, and at once brought its author into note, being full of the rollicking, somewhat cynical, humour then in vogue through Henry Fielding's masterpieces. *The Adventures of Peregrine*

Pickle followed three years later, and proved an equal success, though inferior as a literary production. *Ferdinand*, *Count Fathom*, a repulsive but more cleverly-constructed story, was published in 1753, and then for a time Smollett contented himself with hack-work, such as his translation of *Don Quixote* (1755), his *Compendium of Voyages* (1756), *History of England* (1757-8), and *Present State of All Nations* (1764), besides directing and contributing to the *Critical Review*, of which the first number appeared in 1756. He engaged, too, in political controversy on the Tory side, and produced *The Reprisals* (1757), a farce intended to stimulate hostility towards France. His health now broke down just as he had returned to romance in *Sir Launcelot Greaves* (1762), and in 1763 he went abroad, coming back to publish his travels in 1766. *The History and Adventures of an Atom*, inspired by disappointed hopes, was produced in 1769, when his health compelled him to seek a change at Monte Nero, near Leghorn. Here in his sick room he composed *The Expedition of Humphrey Clinker* (1771), in many respects his most attractive novel, and here he died on September 17th, 1771.

Smuggling denotes (1) the importation or exportation of prohibited goods, and (2) the defrauding the revenue by avoiding a duty levied upon the production or consumption of an article. In its ordinary use, the word is applied only to the former of these, and in these days of Free Trade the custom of smuggling has well-nigh died out, since the profit does not pay the risk. For smuggling the penalty is treble the value of the goods smuggled and a possible fine of £100. Any preventive or excise officer may go on board a ship and search it, and may search any waggon, cart, or other vehicle, and has also the right to search any person aboard of or leaving a ship, and any person obstructing him is liable to a fine of £100. An armed combination of persons for smuggling purposes constitutes a felony. The southern sea-board of England, in the first half of the 19th century, abounded in tales of smugglers, their haunts, their devices, and their occasional pitched battles with the preventive men. The smugglers, who were often decent men in all other respects, held that they were (as of course they were) the real free traders and that they were conferring a boon on the community by providing spirits, tea, tobacco, lace and other contraband goods of the best quality at reasonable prices. For these services the nefarious practices were constantly winked at by the inhabitants of the districts where they made their "runs." Tobacco and spirits are generally the objects now smuggled. It will be remembered that, in his lifetime, his country recognised Robert Burns's genius by making him a gauger, or excise officer. The poet had a few minor encounters with smugglers, but it is said was lenient to small offenders. The Hon. Henry Noel Shore's entertaining book on *Smuggling Days and Smuggling*

Ways (1892) is the best authority on the subject.

Smut (*Ustilago Carbo*), a phycomycetous fungus, parasitic upon grasses, especially oats and other cereals. Its mycelium permeates the seeds and other reproductive organs of the host, forming black spores, which germinate when the seed falls, producing a promycelium with sporidia. These latter, in turn, produce a new mycelium, which penetrates young plants. The allied fungus *Tilletia Caries* produces the similar disease in wheat known as bunt.

Smyrna (Turkish, *İsmir*), the greatest seaport of Turkey-in-Asia, and capital of the vilayet, or province of Aidin, or Smyrna (area, 21,580 square miles; pop., 1,400,000), situated at the head of the Gulf of Smyrna, on the coast of Asia Minor, 212 miles S.W. of Constantinople. It is divided into five quarters, in which Turks, Greeks, Armenians, Jews, and Franks (Europeans) dwell apart. The harbour is one of the best on the Mediterranean. There are large and well-stocked bazaars, a palace for the Governor, many mosques and churches, an English hospital, and some few remains of ancient structures. The principal exports are Turkey carpets, fabrics of silk and Angora goat's hair, sponges, figs (a speciality), raisins and other dried fruits, drugs, opium, tobacco, valonia, hides, leeches, coffee, and some precious



BAY OF SMYRNA.

stones. It is connected by rail with Scutari (for Constantinople) and several places in the interior. Pop., 200,000.

Snail is the name of one of the most familiar members of the Gasteropoda, one of the classes of the Mollusca. The snails are well known, as they are widely distributed, are usually very abundant, and are common objects. The name is often used in a general sense for all the molluscs with a shell (composed of a single shell) which live on land; it is, however, more correctly restricted to those belonging to the genus *Helix*. The Water Snails include species

belonging to the genera *Planorbis*, *Lymnaea*, *Paludina*, etc. The snails have a coiled, spiral shell, which is often prettily ornamented by colour bands; they live on trees, grass, and



COMMON SNAIL.
(*Helix aspersa*).

under stones, etc., and are especially plentiful in limestone districts. The animals feed on vegetable material, which they cut up by means of a long-toothed ribbon or saw-like tongue, known as the "radula." They are active during the summer, and hibernate in winter, when the mouth of the shell is closed by a thin gelatinous film called the "epiphragm." The animals are hermaphrodite, but always pair with other snails, and self-fertilisation never occurs. The snail is a very useful type in biology. The largest living species in England is *Helix pomatia*, the edible or Roman snail. In France it has long played a prominent part both in diet and in medicine, being held to be beneficial in consumption and certain catarrhal complaints. The best kind for the market are reared in Burgundy.

Snake, LEWIS or SHOSHONE RIVER, rising as the South Fork in the Rocky Mountains in the north-west of Wyoming, about 44° N. and 110° W. It first flows southwards, then westwards across Idaho, then northwards along the boundary of Oregon, and finally westwards in Washington until it falls into the Columbia, of which it is the largest affluent. Its principal tributaries are, on the right, the North Fork, Big Wood, Boise, Salmon, Clearwater and Palouse and, on the left, the Salmon Falls, Bruneau, Owyhee, Malheur, Powder and Grande Ronde. It has a total length of from 900 to 1,000 miles. It is navigable as far up as Lewiston, but navigation in the cañons, where its bed is, in places, 4,000 feet below the surface, and upper stretches is impossible owing to falls and rapids. The most important falls are those called Shoshone.

Snake Bird. [DARTER.]

Snakes, a tribe of North American Indians [SHOSHONEAN INDIANS.]

Snakes (*Ophidia*), the popular name of an order of Reptiles, the members of which are well known

from their generally long, lithe bodies, their gliding motion, the absence of external limbs, and the terrible power possessed by many of them of inflicting deadly wounds by means of their poisonous



SNAKE-CHARMER.

(Photo: Bourne & Shepherd, Calcutta.)

fangs. In some of these points they resemble other animals: in shape some are not to be distinguished from limbless lizards—which, in turn, are often confounded with snakes—and limbless fish; while poison-fangs are possessed by at least one lizard, the *Heloderm*. (The words "serpent" and "snake" are practically synonymous, but it has been held that the former has a more technical and more formal shade of meaning than the latter and is therefore seldom applied to limbless lizards, which, as we have just seen, are often mistaken for and called "snakes.") The skin is covered with scales, and is shed periodically; sometimes, as in the case of the Common British Snake (*Tropidonotus natrix*), several times in the year. There are no external ear-openings, and the nostrils are near the extremity of the head. Eyelids are absent, but the transparent skin covers and protects the eyes. Most of them possess scent-glands near the vent, and when irritated they pour forth the ill-smelling secretion very freely. The vertebrae, hollow in front (procelous), are very numerous, and the ribs

function as limbs, by means of which these creatures row their way along on any surface not absolutely smooth. The skeleton of the head is remarkable for the mobility of the bones of the lower jaw, which can be entirely separated from the base of the skull proper, thus enlarging the capacity of the mouth and throat. It is owing to this arrangement and to the elasticity of the skin that snakes can swallow prey so much bigger round than themselves. In some snakes, the Boas, for example, there are traces of a rudimentary pelvis and of equally rudimentary hind legs. The tongue which is cleft at the tip, can be drawn back, and moved freely in any direction, and serves as an organ of touch; but no snake uses it, as the Boas were said to do, to lubricate the prey with saliva before swallowing it. The poison-gland is a specialised salivary gland; and the poison-fangs, borne on the upper jaw, are furnished with a canal or groove down which the poison flows into the wound when a venomous serpent strikes. Most snakes are oviparous; some few are viviparous, and the pythons incubate. One case has occurred in the Zoological Gardens, Regent's Park, and another was reported from Leipzig in 1893. Snakes are widely distributed, but attain their greatest development of size and numbers in tropical countries, where, as might be expected, the most venomous forms are found; and in India the deaths from snake-bite are extremely numerous. Many so-called specifics have been recommended; but the treatment which Sir Joseph Fayrer (*Thanatophidia of India*) recommends is the application of a ligature above the bite, scarification or cautery of the wound, and keeping up the patient's strength. In India a class of men make a living by charming such creatures as the cobras, in spite of the deadly character of their bites. The reptile seems to be fascinated by the monotonous music of a pipe, swaying its body to and fro rhythmically in response to the simple strain. While in this subdued mood it is readily captured by the charmer, who, having extracted the fangs, keeps the snake to tame it for exhibition. In the United Kingdom there are three representatives of the order, the Ring Snake and the Viper, and the Smooth Snake (*Coronella lavis*), confined to the south of England. In habit snakes are mostly terrestrial, some are arboreal, and a few are marine. [SEA-SNAKE.] Most of them prey on mammals, birds and reptiles, and amphibians, and some on molluscs and insects, while most are fond of milk, and one South African snake (*Rachiodon*) subsists on eggs, which are broken by the so-called gular teeth—really the inferior spines of the anterior vertebrae. The contents flow down the throat, and the shell is rejected. The following classification of the order is that generally in use:—

BLIND SNAKES (*Typhlopidae*), the lowest of the order, small burrowing forms that feed on worms and insects. They are found in tropical countries and Australia. There is one European species.

HARMLESS COLUBRIFORM SNAKES (*Colubri-formes*). These are harmless to man, but some of them have the teeth grooved, showing intimate connection with the next group. Here belong the Boas, Pythons, Tree-Snakes, and the British snakes.

COLUBRIFORM VENOMOUS SNAKES (*Colubri-formes venenosus*), as the Cobras, Hamadryas (snake-eating snake), Coral-Snakes, and Sea-Snakes, with erect grooved teeth and poison glands.

VIPERIFORM SNAKES (*Viperiformes*), with erectile, perforated teeth, and poison-glands, as the Vipers, Rattlesnakes, etc.

But, as the poison of snakes is a question of degree rather than of kind, the old division into Harmless and Venomous Snakes will probably lapse in favour of the classification introduced by Mr. G. A. Boulenger, F.R.S., in his *Catalogue of Snakes in the British Museum (Natural History)*, vol. i., where characters of the skull are taken as the basis of grouping. He recognises the following families:—Typhlopidae, Glauconiidae, Boidae, Ilysiidae, Uropeltidae, Xenopeltidae, Colubridae, Amblycephalidae, and Viperidae.

Snake Stones, a term used (1) for charred bones or pieces of porous stones which, when laid on a snake-bite, were said to absorb the poison; (2) for ammonites, from the fact that fraudulent dealers fitted fictitious heads to them and sold them as fossil snakes; and (3) for adder-heads.

Snapdragon, the popular name for *Antirrhinum majus* and allied species, scrophulariaceous plants with racemes of showy flowers, with a saccate "personate," i.e., mask-like, corolla, followed by oblique, two-chambered, many-seeded pore-capsules. The flower differs from that of the toad-flax in having a pouch instead of a spur. *Antirrhinums* are old-fashioned garden favourites.

Sneezing. The act of sneezing consists in a preliminary taking in of air, which is then expelled by spasmodic contraction of the expiratory muscles, all way of escape through the mouth being blocked by contraction of the muscles of the fauces and the descent of the soft palate, and the current of air being in consequence made to pass through the nose.

Snell, JOHN, founder of the Snell Exhibitions at Balliol College, Oxford, was born in 1629 in the parish of Colmonell, Ayrshire, Scotland, in which his father carried on the craft of blacksmith. He studied at Glasgow University and, during the Civil War, sympathising with the Royalists, fought for the King at Worcester in 1651. While in hiding after the battle he made the acquaintance of Sir Orlando Bridgeman (1606-74), the lawyer, who employed him as his clerk and, when raised to the bench, appointed him crier of his court. When Bridgeman became Lord Keeper he continued to be friend Snell and made him seal-bearer, an office he held during the chancellorship of the

1st Earl of Shaftesbury. He was afterwards secretary to the Duke of Monmouth and managed the ducal estates in Scotland. He died at Oxford on August 6th, 1679. He always retained a warm affection for his Alma Mater and left part of his estate to found scholarships for the purpose of carrying on the education of Glasgow students at a college in Oxford (decreed in 1693 by the Court of Chancery to be Balliol). The provision that the exhibitors should enter the Church and proceed to Scotland for preferment was finally held to be inoperative in consequence of the disestablishment of Episcopacy in Scotland. Adam Smith, John Gibson Lockhart, John Wilson ("Christopher North"), Sir William Hamilton, Archbishop A. C. Tait and Principal Shairp were all Snell Exhibitors.

Snider, JACOB, inventor of the Snider rifle, born in 1820, started in business as a wine merchant in Philadelphia, Pennsylvania, but failed. He then devoted himself to mechanical inventions, and in 1859 came over to Europe with a model of the Mount Storm breech-loader, made by converting the muzzle-loading rifle of the United States Army. His modified plans were at last accepted by the British War Office for the conversion of the Enfield rifle, and the new weapon was known by the inventor's name. Endless disputes then followed as to his remuneration, till, crushed by poverty and disappointment, he died on October 25th, 1866, before he got his claims recognised, although it is melancholy to think that the Government had, after the usual culpable delay, decided on the amount and principle practically whilst the distracted inventor was lying in *articulo mortis*.

Snipe, a bird belonging to the genus *Gallinago* of the Wading family Scolopacidae, with twenty-four species universally distributed. The bill is long, straight, slightly flexible, extremely sensitive, and serves as a delicate organ of touch by means of which these birds procure the worms and insects on which they feed, and which they obtain by thrusting the bill into the mud and soft earth of the marshy and fenny places they frequent. Three species are British. The Common Snipe (*G. calesis*) spends the summer and breeds in the United Kingdom, leaving in autumn and returning in the spring. The total length is about eleven inches. The general plumage is shades of brown and buff marked and barred with black; the belly is white. The Jack Snipe (*G. gallinula*), a much smaller species, is a winter visitor. The Great, Solitary, or Woodcock Snipe (*G. major*) visits the British Isles in the autumn in its southward migration. These birds afford excellent sport and are all highly valued for the table.

Snow, the crystalline form of atmospheric moisture formed when the temperature is below the freezing-point. Snow falls in flakes, each of which consists of a number of sym-

metrically six-rayed, star-like crystals, sometimes exceedingly complex in form. More than a thousand forms have been described. The opaque whiteness of snow, like that of table-salt, results from the numerous reflections from



SNOW CRYSTAL.

the faces of the minute crystals, which individually are transparent. Snowflakes contain about nine times as many volumes of air, entangled, so to speak, among their crystals, as they contain water; so that a fall of snow ten inches deep is about equivalent to an inch of rain. Snow is a bad conductor of heat, and it is owing to this property that as it lies on the ground it protects plants from frost. Snow never falls at the sea-level within the tropics, and seldom in the southern hemisphere north of 48° S. The snow-limit for sea-level passes through Buenos Aires, Cape Town, Melbourne, and Sydney in the southern, and through Mexico, North Africa, Asia Minor, the south of the Caspian, the north of Hindostan, and Canton, in the northern hemisphere. In England, whilst it descends to sea-level in winter, it rises in summer several miles overhead, the fleecy cirrus clouds then seen being composed of snow. Considerably higher than the isotherm of 32° is the snow-line, or line of perpetual snow, above which the snow never entirely melts. At Quito, near the equator, it is at 15,800 feet; in Mexico (19° N.) at 14,800; on the south side of the Himalaya, which is supplied with abundant moisture from the Indian Ocean, it is at 16,200 feet; but on the north side, which is heated by the dry air from Tibet, at 17,400. In Granada (37° N.) it is at 11,200 feet, and on Mont Blanc (46° N.) 8,500 feet. Though there is generally some snow in the protected crevices on Ben Nevis and other Highland hills in Scotland, no point in the British Isles actually reaches the snow-line. In Iceland (60° N.) it is at 3,100 feet; at the North Cape 2,000 feet, and at Spitsbergen at sea-level. Besides the protection of vegetation, the chief geological actions of snow are the formation of avalanches, glaciers, and summer floods, such as those of Mesopotamia.

Snowball Tree. [GUELDER ROSE.]

Snowberry (*Symphoricarpos racemosus*), a North American shrub, belonging to the honeysuckle order, commonly grown in English gardens. It has roundish smooth blue-green leaves; small pink flowers and large globular dead-white berries, which are four-chambered but have two chambers aborted, the other two each containing one seed. The cells of the pulp of the fruit are exceptionally large.

Snow-Bird (*Fringilla hiemalis*), a North American finch, being quite as familiar a bird in the United States as the robin is in Great Britain. Its length is about six inches; the

plumage is slate-brown above, the lower parts and the two outer tail feathers are white.

Snow Bunting (*Plectrophenax nivalis*), an arctic and sub-arctic finch, the most northern of the Passerine birds, coming southwards in winter as far as Morocco. Large flocks occur in winter in the British Isles, and some have remained to breed in the north of Scotland and Sletland. In Iceland it is the commonest of the smaller birds, a pair generally establishing themselves in every suitable locality. The total length is a little more than six inches, and the plumage black-and-white above and white below. The coloration, however, varies considerably at different seasons, and on that account these birds have been described under more than one name. In winter they feed on seeds, and in summer on insects. Soon after their arrival in their winter quarters they become very fat, and are then esteemed a delicacy. The Greenlanders take them in great numbers, and dry them for future use.

Snowdon ("the Hill of Snow"; the Welsh name Eryri means "Eagle Top"), a mountain in Carnarvonshire, Wales, 10 miles S.E. of Carnarvon. It is 3,571 feet in altitude and is thus not only the highest hill in Wales but also the highest south of the Scottish border. It is, moreover, the most majestic, comprising its five peaks of Y Wyddfa (the loftiest), Yr Aran, Lliwedd, Crib-y-Ddysgyl and Cribgoch. If we include the outlying spurs and lower groups that hedge in the central elevation, the mass occupies an area extending from north to south about 12 miles, and from east to west 6 miles, bounded by Llanrug, Bettws-garmon, Beddgelert, Nantgwynant ("the Vale of Waters"), Capel Curig and Llanberis. Beyond these limits are the wider bounds of the district once called Snowdonia, which stretches from Penmaenmawr to the neighbourhood of Nevin. The view from the summit where the five ribs or spokes meet is extremely imposing. Close at hand are rugged hollows and awesome precipices, beyond are glens characterised by wild and picturesque scenery, and farther off the sea and the English marching counties. The Pass of Llanberis, on the north, and the Pass of Aberglaslyn are noted for their savage grandeur. Several lakes enhance the charm of the mountain landscape. Since 1897 a rack-and-pinion railway, 5 miles long, has enabled the ascent to be made from Llanberis to the hotel on the summit. There are stations at intervals of a mile at Waterfall (1 mile), Hebron (2), Half Way (3), Clogwyn (4), and Snowdon (5). During the winter, when the ordinary service is suspended, special trains run by arrangement for the accommodation of parties. The gauge is 2 feet 7½ inches and the cost of construction per mile amounted to £11,550.

Snowdrop (*Galanthus nivalis*), a beautiful British winter-flowering amaryllidaceous plant. It has a bulb, a pair of narrow linear

glaucous leaves, and one or two drooping white flowers with a membranous two-nerved spathe, a spreading white calyx, and three erect notched petals, white with green points. In gardens it is often doubled, and several other species are also cultivated.

Snyders, FRANZ, painter, was born at Antwerp in 1579, and studied painting under



FRANZ SNYDERS.

(From the portrait by Van Dyck.)

Peter Breughel and Hendrik van Balen, devoting himself at first chiefly to still-life and flowers, but ultimately preferring animal subjects in which he showed extraordinary skill. Probably no one ever succeeded better in catching the spirit of wild nature and in reproducing the colour and texture of fur and feather. His composition was almost always spontaneous and his drawing as sure as it was vigorous. He has never been excelled in the depicting of the fury of fight or the movement of the chase. He painted numerous versions of "Stag Hunt" and "Boar Hunt" and is very familiar through the medium of engravings. He frequently co-operated with Rubens and Jordaens, and was court painter to the Archduke Albert, Governor of the Netherlands. He died at Antwerp in 1657. There are examples of his work in Hampton Court Palace and the National Gallery in Edinburgh.

Soane, SIR JOHN, whose real name was Swan, architect and founder of the Soane Museum, was born at Hitchchurch, near Reading, Berkshire, on September 10th, 1753. Evincing early a marked skill in drawing, he studied at the Royal Academy Schools and carried off, in 1772, the silver medal for a drawing of the Banqueting House at Whitehall and, in 1776, the gold medal and travelling studentship for a design for a triumphal arch. After spending three years, chiefly in Rome, he settled down to practise in London in 1780 and in 1788 was appointed architect to the Governors of the Bank of England, for whom he designed the

present building in the Roman Corinthian style. In 1791 he became Clerk of the Works at St. James's Palace and the Houses of Parliament and was elected A.R.A. in 1795 and R.A. in 1802. In 1806 he succeeded George Dance the younger (1741-1825) as Professor of Architecture at the Royal Academy. About 1808 he was engaged in the restoration work at Oxford, especially at Brasenose College, and in 1812 erected the gallery at Dulwich for the reception of the pictures bequeathed to the College by Sir Peter Francis Bourgeois, R.A. (1756-1811). He was knighted in 1831—refusing a baronetcy, it is said, so that his son George (1790-1860), with whom he had a standing quarrel, might not inherit anything from him, retired from practice and all appointments in 1833, received from his brother architects in 1835 a set of medals in recognition of his public services and died at his house in Lincoln's Inn Fields, London, on January 20th, 1837. Four years before this date he had presented to the nation the house and its contents, which constituted a gallery of extreme value and interest and is known as the Soane Museum. Amongst some of its choicest possessions are William Hogarth's series of the "Rake's Progress" and the "Election" and Sir Joshua Reynolds's "Snake in the Grass," besides the famous alabaster sarcophagus



SIR JOHN SOANE'S MUSEUM.

(Photo: Pictorial Agency.)

which had been brought from Egypt by Giovanni Battista Belzoni (1778-1823). The collection contains numerous remains of antiquity, gems, scarce books and illuminated MSS.

Soap has been known since the classical period at any rate. It is spoken of by Pliny and certain other writers, while remains of a soap

manufactory were discovered within the ruins of Pompeii, containing specimens of the substance which did not differ essentially from what constitutes the soap of the present day. Although known for such a lengthy period of time, the improvements in the process of its manufacture have been but slight. All soaps consist of alkalies united with the acid present in various oils or fats. These latter compounds consist of an acid combined with glycerine, and in the process of soap-making this glycerine is replaced by soda or potash, so that the resulting soap is really merely the sodium (or potassium) salt of the organic fatty acid. The chief acids present in the fats are stearic, margaric, and, to a smaller extent, oleic acids, and it is the salts of these compounds which, in different proportions, constitute most soaps. For the manufacture the fat, such as tallow or palm oil, is placed in a large cauldron or boiler, the necessary amount of soda solution or lye is added, and the whole is kept boiling until the action is completed (from 1 to 2 hours). A quantity of salt is then added, which causes the soap to separate out and rise to the surface, as it is not soluble in salt solution. It is then ladled into wood or iron frames or moulds and allowed to set, after which it is cut into sticks by wire and placed in a drying-room to dry. Cakes, etc., and those used for toilet purposes, are made by pressure in moulds. For white or curd soap, tallow, or palm oil (which should be first bleached), or olive oil is usually employed, whilst the addition of lard improves the quality of the soap. In the yellow soaps resin is also added to the other ingredients, while marbled soaps or mottled soaps owe their appearance to the introduction of salts of iron. Toilet soaps do not differ essentially from the ordinary washing or curd soap, but are merely clarified and perfumed and coloured or marbled by mixing in small quantities of pigments or dyes. Soft-soap contains potash in place of soda—i.e., a potassium salt of the organic acid—and is usually made from a "drying oil," as hempseed oil, etc., instead of from tallow or palm oil. By lime and other salts soap is precipitated, as the lime salts of these organic acids are insoluble; owing to this hard water is not suitable for washing purposes, as the lime salts in the water combine with the soap acids, and no lather results until all have been thus got rid of. According to the great chemist, Baron Liebig (1803-73), the quantity of soap used may be regarded as a measure of the civilisation of a country. Judged by this standard, the United Kingdom maintains the leading place, more being manufactured in this than in any other country, and the quantity used per head is equivalent to about 8.5 lbs. per annum, exclusive of that used in manufacturing operations. On the other hand, there is the point of view entertained by some Continental nations that the British must be an exceptionally dirty people since they are always washing themselves.

Soap Bubbles. The outside of a liquid acts just as though it were an elastic skin stretched into a particular shape. If, therefore, we could get rid of the effect of the weight of a drop of liquid, we should see only the effect of this skin. When a very small drop is taken, we are approaching this state of things, and we notice that the drop is very nearly spherical, since the elastic skin pulls it till its surface is the smallest possible for the given quantity of liquid, and the sphere gives this minimum surface. A soap bubble shows this in a beautiful manner, for in this case we have practically isolated the elastic skin itself. That the skin is exerting pressure upon the air inside it can be shown in the following way:—Blow a bubble at the end of a tube or pipe, and then remove the pipe from the mouth; the bubble immediately begins to force the air back again along the stem of the pipe, and out through the open end, while it subsides into a flat film. It is easily shown also that a small bubble exerts a greater pressure on the contained air than a larger one. If the interiors of two bubbles of different sizes be connected by a tube, the small one will grow smaller, while the larger one will increase, owing to the greater pressure of the smaller skin. The pressure, therefore, depends on the curvature of the bubble, and this is true whether the bubble be spherical or of any other shape, only that the value of the curvature is more readily realised in the case of a sphere than in that of a cylinder or other curved surface. Two bubbles can be made to push each other about, but yet the actual films do not touch; there is a thin layer of air between the two, and this thin layer is present when one bubble is blown inside another, so that the two bubbles do not (if carefully blown) coalesce or burst. When they are merely externally resting against each other, the presence of an article electrified to the slightest degree will cause their union. Hence such a pair of bubbles form a delicate test for small quantities of electricity. The blowing of bubbles inside others, although apparently a very simple matter, is really a difficult feat to accomplish. Sir Isaac Newton devoted much thought to the study of soap bubbles. He observed that, as the liquid thins away from the top of the bubble, coloured rings grow in regular order, spreading outwards till they attain their greatest diameter: then they close in gradually on the under side and vanish at the bottom. The colours pass through the most beautiful tints, eventually becoming dark red; then they increase in lightness to a dirty-white, which again darkens, till at last a black spot appears at the top, and this reaches a diameter of $\frac{1}{4}$ or $\frac{1}{2}$ of an inch, and then the bubble bursts. As a bubble is blown larger and larger its skin resists stretching, and Lord Kelvin has shown, in his lecture on the size of atoms, that the film could not keep up its tensile strength to the point when its thickness is as little as $\frac{1}{1000000}$ of a centimetre; but he says it is scarcely conceiv-

able that there can be any falling off in this tensile strength as long as the film is several molecules in thickness; hence, when the tensile strength fails, i.e., when the bubble bursts, we can assume that the film is only a single molecule thick. The thickness of the black spot has been shown by Professor A. W. Reinold, F.R.S., and Sir Arthur Rücker, F.R.S., to be only slightly more than $\frac{1}{1000000}$ centimetre, and, as the film breaks soon after this spot appears, it is probably then something like $\frac{1}{1000000}$ centimetre thick. This, therefore, is the order of size of a molecule of water.

Soapstone. [STEATITE.]

Soapwort (*Saponaria officinalis*), a shrubby plant belonging to the order Caryophyllaceæ, with broad leaves and a large paniculate cyme of fragrant rose-coloured flowers, often double. It is not uncommon as an escape from cultivation. The whole plant is saponaceous, the root being employed in Asia Minor to bleach silk and wool and give them a lustre, which it is said to impart without injuring the most sensitive colour.

Sobieski. [JOHN III. OF POLAND.]

Socialism. The modern movement covered by this name must be looked at in two aspects. It expresses, with more or less consciousness, a religious or spiritual impulse, and it advocates practical measures for readjusting the forms of society, more especially (at this moment) industrial forms, so as to give fuller expression and satisfaction to the promptings of that impulse. In the spiritual direction it shows Hegel's definition of religion, as "the knowledge by the Finite Spirit of its essence as Absolute Spirit," reflected in the Christian doctrine of the brotherhood and equality of men without distinction of class or nation (on which the Christian Socialist school is based), and paraphrased in the revolutionary watchword, "Liberty, Equality, Fraternity," entering into the secular-Socialist analysis, which exhibits each individual as produced, and his abilities and powers as conditioned by, and therefore as due to, Society. Inasmuch, however, as this impulse seeks form in conscious life, and mere bodily sustenance is the first condition of life for the individual, the Socialist movement appears, over much of its recognised area, as concerned with a material aim, namely, the establishment of the primary basis of tolerable human existence. And, broadly, whereas the social theory of Individualism asserts free competition as the safest method for the establishment of this material basis, and encourages the belief that the market price of each man's abilities and the total wealth that the arrangements of society may enable him to amass (no matter at what cost to his fellows) represent the true value of those abilities and are produced and justly earned by that man, the Socialist theory asserts that organised and intelligent combination is the more rational and more

effective means to this end, and that, as the very existence of any form of society implies a large measure of co-operation, whether deliberately or automatically established, it is impossible to attribute, as of right, any portion of the social product to any particular individual. It therefore prescribes as the canon or production and distribution the formula, "From everyone according to his abilities; to everyone according to his needs." The Socialist or concrete view of society as a living organism of which individuals are members, as leaves of a tree, produced by it and, in their turn, building it up, as opposed to the individualist or abstract view, underlies and is very clearly expounded in the political speculations of Plato (see especially *Republic*) and Aristotle (*Politics*). John Ruskin was, perhaps, its most vivid and most stimulating exponent in the 19th century, and it is at least suggestive that while his influence upon Art is declining his influence in Sociology manifests an even stronger upward tendency than it has yet exhibited. Mediæval revolutionary movements, such as the English, and especially the German, peasant revolts, though provoked by economic oppression, very generally expressed their aspirations in the precise terms of modern Christian Socialism and their political demands in formulas still accepted by contemporary Social Democracy. Forms of Communism, especially in land, and revolts of the poor against rich oppressors, have been exemplified in most countries and in nearly all ages. The name Socialism, however, and the practical activity of the contemporary Socialist movement, both in its industrial aims and in its speculative influence, date from the earliest quarter of the 19th century.

The movement first found notable expression in the doctrines and activities of Robert Owen in Great Britain, and Claude Henri Saint-Simon and François Marie Charles Fourier in France. It appeared as a revolt against the condition to which the majority of the peoples of those two countries had been, or were being, reduced by the revolution in industrial processes brought about by the inventions of machinery, steam-power and the factory system of production. The fact that the private ownership of land gave to its possessors power and practical ownership over those who cultivated the land had been a cause of social trouble long familiar to all European nations. The evil had been mitigated, and its essential nature concealed, in England especially, by the substitution of money rents for personal service from tenants; but already economic writers had advocated the nationalisation of land as the only remedy for the power of private landowners to dictate to other citizens the terms on which they should be allowed to earn their living. The Socialists pointed out that the substitution of the factory system of production, in which masses of men are employed with expensive machinery, for the system under which the craftsman had owned

his own tools and produced his work independently, or as one of a small democratic group, and disposed of it himself in open market, had reduced the bulk of the workers, especially in England, where the manufacturing industry was most advanced, to a position in which they were necessarily dependent upon the owners of capital for leave to work for their living, and were compelled to sell their labour for a price, determined, not by the market value of its product, but by competition among themselves which tended (as the political economists insisted) to reduce wages to just such a level as would enable the workers to live and maintain their class. The surplus of the value of the product over the wages thus assigned to the worker, is retained under this system by the capitalist, as rent is retained by the landlord, without any intervention by either in the processes of production. For the owner of the capital, such as a shareholder in a railway, is to be distinguished from a manager or organiser of labour, whose remuneration is of the nature of wages, and is determined by its value in competition. This system, whilst enormously increasing the power of man to satisfy his wants, had turned to the advantage chiefly of the owners and organisers of capital, leaving the mass of wage-earners poor, and with no control over their opportunities of livelihood, whilst the vicissitudes of blind competition continually disorganised production, ruined employers, and threw wage-earners out of employment.

This analysis, most completely elaborated by Karl Marx in his work on *Capital*, is the basis of the practical programme of Social Democracy, generally described as Collectivism. It aims at placing the ownership and control of capital, and the organisation and direction of industry, in the hands of the workers of all kinds, and eliminating the sleeping partner that draws profits on account of mere ownership whilst dictating the conditions of employment. The Co-operative movement in the United Kingdom, inspired by the Socialism preached by Robert Owen, set out with this object in view. It has had much success in effecting organisation of distribution, but very little in the department of production. The German school of Socialists, of which Ferdinand Lassalle was the earliest conspicuous politician, has generally held that this transfer of ownership and control could only be effected through the instrumentality of the State; pointing out that the failure of the Co-operative movement in productive industry was due to the inability of workers without capital to compete successfully against the organised power of the capitalist employing class. Lassalle therefore argued that the State should give credit to groups of workmen to enable them to engage in production. This programme had but short vitality, and the Social Democratic movement of to-day aims nowhere at enabling sections of workmen in particular industries to become owners and controllers

of capital, to be used for their benefit as a group, but always at effecting the transfer of such ownership or control to the national or local community through the forms of political democracy. The aim of the Collectivist movement is to effect in the industrial world what the democratic movement has aimed at in the political world; and, just as it is a matter of controversy and experience which branches of political administration should be regulated through the national Executive, and which through local and municipal authorities, so it is recognised that the administration of industry on Collectivist principles must necessarily exhibit various degrees of centralisation.

Whilst, therefore, Socialists habitually speak of the transfer of ownership to "the State," the form of their practical proposals varies greatly, according to circumstances. The highly-centralised German system of government is reflected in the comparatively centralising tendency of the German Socialist party (which now numbers over one million electors and holds several seats in Parliament). In France and Italy the long-established and extensive autonomy of local communes inspires a more general inclination towards the advocacy of decentralisation. The recognition, however, of the fact that industrial and commercial class interests tend more and more to transcend not only local, but national, limits, that important industrial services are very generally most efficiently provided through combination of capital and concentration of control, and that the effect of the private ownership of capital is continually to promote such combination, counterbalances the tendency to distrust that extension of bureaucracy which seems to be involved in centralisation, and the hesitation to attempt the difficult task of establishing democratic control over productive and distributive industries. In Great Britain the Collectivist movement has made gradual but continuous progress, through the legal regulation of hours and conditions of work and the municipal acquisition and administration of property and industries. The Poor Law and, much more notably, the Education Law, are embodiments of Socialist principle, whilst the principle of regulating wages by democratic consent, instead of by competition (one of the earliest projects of Socialists), at one time engaged much public attention (in the form of the plea for "a living wage") and has established itself in the national arsenals and dockyards and in the election of many local authorities under pledge to pay Trade Union rates of wages to their employees.

Social Democrats, who form the majority of Socialists, aim, therefore, at abolishing the subjection of labour to capital, and the recurrent over-production and lack of employment, which are features of the competitive system, together with the social inequality between workers and possessors, by means of constructive organisation under democratic

control: and they aim more and more universally at acquiring and establishing this control, not by any sudden revolutionary stroke, but by altering the laws and institutions of each country through their existing political machinery. Anarchism, which must be regarded as a branch of the Socialist movement, would abolish the subjection of the wage-earners by simple destruction of all existing organisation and authority.

Society, an organised body of men and women banded together for the promotion of some common purpose, whether scientific, literary, political, religious, philanthropic, social, or other. Nearly every society has a recognised headquarters and many societies are incorporated by Royal charter. They are governed by committees, presidents and other office-bearers, elected by the members in annual meeting assembled. The scope of many is so wide as to be practically indeterminate, whilst in others the objects are so rigidly defined under their constitution that the promotion of other objects, quite unobjectionable, would be *ultra vires*. Several are select and exclusive and the doors of others are fairly wide. It is difficult to imagine anyone but a chemist, for example, being eager to enter the Chemical Society, while membership of the Royal Geographical, or the Zoological, or the Japan Society is legitimately open to all who are specially interested, as intelligent persons, in travel and exploration, or natural history, or the people and customs of the Land of the Rising Sun, without such candidates having actively pursued any branch of geography, or zoology, or having any actual relationship, personal or otherwise than academic, with Japan. It is not necessary to consider the comparative merits of the various scientific and learned societies, but it may be said that the Fellowship of the Royal Society is, by common consent, the highest honour of the kind at the disposal of professional *savants*, though it is probable that the conditions under which it is conferred are open to improvement. Cases are not unknown in which poor men who have devoted their lives to the pursuit of science and who on the record of their lifework were entitled to enjoy the honour, yet went to their graves without the final recognition of the Royal Society. The following is a list of the principal societies in the United Kingdom.

| FOUNDED | |
|--|------|
| Royal Society, Burlington House, London (F.R.S.) | 1662 |
| Royal Dublin Society | 1684 |
| Society for the Promotion of Christian Knowledge, commonly known as the S.P.C.K. | 1698 |
| Society of Antiquaries (F.S.A.) | 1717 |
| Society of Arts, John Street, Adelphi, London | 1753 |
| Gaelic Society of London, Crane Court, Fleet Street | 1777 |
| Manchester Literary and Philosophical Society | 1781 |
| Royal Society of Edinburgh (F.R.S.E.) | 1782 |
| Highland and Agricultural Society | 1785 |
| Royal Irish Academy | 1786 |
| Linnean Society, Burlington House (F.L.S.) | 1788 |
| Newcastle Literary and Philosophical Society | 1798 |
| Royal Institution, Albemarle Street, London | 1800 |
| Glasgow Philosophical Society | 1802 |

| FOUNDED | |
|---|------|
| Royal Horticultural Society (F.R.H.S.) | 1804 |
| Royal Medical and Chirurgical Society | 1805 |
| London Institution, Finsbury Square | 1805 |
| Geological Society, Burlington House (F.G.S.) | 1807 |
| Swedenborg Society, Bloomsbury Street, London | 1810 |
| Liverpool Literary and Philosophical Society | 1812 |
| Peace Society | 1816 |
| Institution of Civil Engineers | 1818 |
| Leeds Literary and Philosophical Society | 1818 |
| Hunterian Society | 1819 |
| Cambridge Philosophical Society | 1819 |
| Royal Astronomical Society, Burlington House (F.R.A.S.) | 1820 |
| Royal Scottish Society of Arts | 1821 |
| Hull Literary and Philosophical Society | 1822 |
| Yorkshire Philosophical Society | 1822 |
| Sheffield Literary and Philosophical Society | 1822 |
| Royal Society of Literature (F.R.S.L.) | 1828 |
| Royal Asiatic Society | 1828 |
| Zoological Society, Hanover Square, London (F.Z.S.) | 1826 |
| Incorporated Law Society | 1827 |
| Society for the Diffusion of Useful Knowledge | 1827 |
| Royal Geographical Society, Savile Row, London (F.R.G.S.) | 1830 |
| Royal United Service Institution | 1831 |
| Royal Dublin Society | 1831 |
| Harvelian Society | 1831 |
| British Association, Burlington House | 1831 |
| British Medical Association | 1832 |
| Entomological Society | 1838 |
| Statistical Society (F.S.S.) | 1834 |
| Royal Institute of British Architects (F.R.B.A.) | 1834 |
| Numismatic Society | 1836 |
| Royal Agricultural Society | 1838 |
| Royal Microscopical Society | 1839 |
| Royal Botanical Society, London | 1839 |
| London Library | 1840 |
| Chemical Society, Burlington House (F.C.S.) | 1841 |
| Pharmaceutical Society | 1841 |
| Philological Society | 1842 |
| Royal Archaeological Institute | 1843 |
| Sydenham Society | 1843 |
| Edinological Society | 1843 |
| Ray Society | 1844 |
| Hakluyt Society | 1846 |
| Palaontographical Society | 1847 |
| Institute of Mechanical Engineers | 1847 |
| Institute of Actuaries | 1848 |
| Royal Meteorological Society | 1850 |
| Royal Photographic Society | 1852 |
| Society for the Encouragement of the Fine Arts | 1853 |
| Institution of Naval Architects | 1850 |
| Clinical Society | 1861 |
| Anthropological Society | 1863 |
| Early English Text Society | 1864 |
| Palestine Exploration Fund (P.E.F.) | 1865 |
| Chaucer Society | 1866 |
| Royal Historical Society | 1868 |
| Colonial Institute | 1868 |
| Iron and Steel Institute | 1869 |
| Institution of Electrical Engineers | 1871 |
| Palaontographical Society | 1878 |
| English Dialect Society | 1878 |
| New Shakspeare Society | 1878 |
| Association of Public Analysts | 1874 |
| Psychological Society | 1876 |
| Sanitary Institute of Great Britain | 1876 |
| Library Association | 1877 |
| Folklore Society | 1878 |
| Hellenic Society | 1879 |
| Institute of Bankers | 1879 |
| London Topographical Society | 1879 |
| Egypt Exploration Fund | 1881 |
| Browning Society | 1881 |
| Society for Psychological Research | 1882 |
| Society of Authors | 1884 |
| Selborne Society | 1885 |
| Shelley Society | 1885 |
| Goethe Society | 1886 |
| Selden Society | 1887 |
| Ruskin Society | 1890 |
| Japan Society | 1892 |
| Irish Literary Society | 1900 |
| Royal Economic Society | 1902 |

It will be seen from the foregoing list, which, though not complete, is representative, that, as might be expected, the tendency is growing for the establishment of specialised societies for the exploitation of a particular person or thing.

Society Islands, or TAHITI ARCHIPELAGO, a group in the South Pacific, belonging to France, and lying broadly between 16° and 18° S. and 148° and 152° 30' W. They are disposed in two masses, namely, the Leeward or Society Islands proper (of which the chief are Huahine, Raiatea and Bora Bora) and the Windward or Tahitian, including Tahiti and Moorea. They occupy an area of about 700 square miles and are mostly of volcanic origin, surrounded by coral reefs. The climate is healthy and the coconut, banana, sugar-cane, orange and vanilla are grown. The principal exports comprise copra, mother-of-pearl, fruit, edible fungus, and coconut oil. They are administered from Papeete in Tahiti. The natives are Polynesians of fine physique. The islands were discovered in 1806 by Pedro Fernandez de Quiros, the Spanish sailor, visited by Captain Cook in 1769 and formally annexed in 1880 to France, which had extended a *quasi*-Protectorate over them during the forty previous years. By some geographers the Leeward are regarded as an independent group. Pop. (estimated), 18,000.

Socinus, the Latinised form of the name of Soccini or Sozini, the descendants of a Tuscan banker named Sozzo, and the founders of the theological sect still known as Socinians.

(1) LUDOVICO FRANCESCO MARIA SOZINO, theologian, was born at Siena, Italy, on January 29th, 1525, and educated for the law at Bologna. He was drawn into the Evangelical movement, and after a stay at Venice, then the headquarters of religious reform in Italy, travelled through Switzerland, France, England, and Holland, making the acquaintance of Philip Melancthon, Sebastian Münster, Johann Forster, and other kindred spirits, and settling in 1554 at Zürich, where John Calvin became a close friend. However, his speculative intellect raised questions as to the resurrection of the body, predestination, the sacraments, and the nature of the Trinity, which Calvin declined to solve. He, nevertheless, came to no open breach, warned, perhaps, by the fate of Michael Servetus, and died at Zürich on May 14th, 1582, in some pecuniary straits, owing to the sequestration of his Italian property. His principal extant works are *De Sacramentis Dissertatio* and *De Resurrectione*, the latter in a fragmentary condition.

(2) FAUSTO PAOLO SOZINO, theologian, nephew of the foregoing, was born at Siena, Italy, on December 5th, 1539, and was educated principally at home. Having inherited a considerable fortune, he led a rather desultory youth as a member of the famous Accademia degli Intornati. In 1562, after a short residence at Lyons, he joined the Reformers at Geneva, and published the *Explicatio* of the poem to St. John's

Gospel, in which he did not recognise the divinity of Christ in the usual orthodox sense. He relapsed to Catholicism in 1563, but returned to theology in 1570 with a treatise, *De Auctoritate Sanctæ Scripturæ*, and, settling at Basel, wrote *De Jesu Christo Servatore* (1578). He now went into Transylvania, and thence into Poland, casting in his lot with the Antitrinitarians, though he never fully accepted their doctrines. His *De Jesu Christi Natura* was published in 1584. Hitherto he had written anonymously, but when the Holy Office at Siena deprived him, in 1590, of his estates, he threw off the mask. A mob at Cracow attacked him as a heretic, and he had to take refuge at Luclawice, some thirty miles to the east of that city, where he died on March 4th, 1604. It is said that his tombstone bore the following bitter epitaph, but no trace of it on the stone is now discernible:—

Tota ruit Babylon: destruxit tecta Lutherus,
Calvinus muros, sed fundamenta Socinus.

This may be Englished "Babylon [that is, the Catholic Church] is in ruins: Luther destroyed the roof, Calvin the walls, and Socinus the foundations."

Sociology is the name given to denote the endeavours that have been made from time to time to investigate social phenomena and to establish some law governing their occurrence. In a wide sense it is coterminous with what the ancients called "Politics," but now it generally concerns itself with the actions of mankind as forming general society. The science rests on no assured basis, and, so far, the so-called laws seem in a great measure fanciful. Herbert Spencer (1820–1903) is perhaps the greatest authority on the question as it exists at the present day.

Socotra, an island in the Indian Ocean, 135 miles E.N.E. of Cape Guardafui, a promontory of Somaliland, Africa, and close to the mouth of the Gulf of Aden. The area covers 1,382 square miles, the shores being flat, but the central table-land attains an altitude of 800 feet, and in Mount Haghier reaches a height of 4,656 feet. The products include aloes, myrrh, frankincense, dragon's blood and other gums, tamarinds, tobacco, millet and dates. Sheep, cattle and goats abound, the ghee, or clarified butter, made from the milk of the cows and goats, being the principal item of export. Habidu on the north coast is the capital. The island came under British protection in 1876 by arrangement with the Sultan of Socotra and constitutes a dependency of Aden. Pop. (estimated), 12,000.

Socrates, philosopher, the son of Sophroniscus, a statuary, and Phænarete, a midwife, was born in Athens about 470 B.C. He followed at first his father's profession of sculptor, giving it up to start on a sort of moral and intellectual mission, to which he was urged, he conceived, by divine impulse. However, he discharged the duties of a citizen; first as a

soldier at Potidæa, Delium, and Amphipolis (where he showed courage and steadfastness), later as a senator, when he boldly resisted unconstitutional measures. But the work of his life was to convict his fellow-creatures of ignorance, and, above all, to expose the spurious teaching of the Sophists. His method was to lead chance people, whom he met in the public places, into conversations on moral and social topics, and by a skilful process of questioning, to unveil the falsity or inadequacy of their ideas and principles. The results were negative, though the tendency of the process was towards establishing a higher ethical standard than that of the age. Many took part in the discussions as mere lessons in the art of verbal fencing. A smaller number sought counsel and strengthening for the duties of life; whilst a few grasped the true significance of the master's mission, and formed the nucleus of a school. The power of the man may be inferred from the fact that characters so widely different as Plato, Alcibiades, Xenophon, and Critias came under his influence. Personally he was short, stout, grotesque and sensual in feature, his appearance suggesting a Silenus rather than a saint, yet his habits were simple to austerity. He wore the same clothes summer and winter, dispensed with shoes, ate and drank like the poorest slave, but did not abjure social pleasures or advocate asceticism as an end in itself. Ironical humour was one of his most potent instruments, but he used it as a philanthropist, and for grave wrongs he had sterner weapons of direct reproof. Socrates showed profound respect for even the conventional religion of his age and country, observing the usual rites, and accepting the signs and oracles, whilst he rejected the grosser legends and superstitions, which he attributed to lying poets. He claimed, however, to have a special divine sign or voice, sometimes called his "dæmon," and the precise nature of this belief of his has provoked much controversy. Probably he meant no more than is expressed by our word conscience, with the addition of a direct religious sanction, such as fervent piety often accepts as an objective phenomenon. With his wife, Xanthippe, a shrew, and a woman incapable of appreciating his aims, he seems to have led a wretched existence, tempered by his philosophic forbearance. Though opposed to the oligarchical tyranny of the Four Hundred and the Thirty, Socrates was even more adverse to the unmixed democracy, with its election by lot and its payment for political services. Accordingly, on the triumph of the demagogues, he was in 399 accused of denying the gods and corrupting the young, and being convicted by an overwhelming majority of the jury, was sentenced to death. He passed thirty days before execution (the sacred ship sent annually to the festival on the island of Delos, during the absence of which no one might be put to death, having been providentially delayed for an exceptional period) in the noble discourses on the immortality of the soul,

which was recorded in Plato's *Phædo*, drank the cup of hemlock, and died. He left no writings, but we know a great deal about the philosopher and his opinions from the Memoirs and other works of Xenophon and Plato's Dialogues.

Socrates of Byzantium, Church historian, is only known to us through his *Ecclesiastical History*, which takes up the thread of Eusebius in A.D. 306, and carries it on to 439. He used materials provided by earlier writers, but introduced a good deal of oral tradition and contemporary information. Origen is his hero, and he occupies a middle position between the Athanasians and Arians, but dislikes dogmatic refinements and protests against persecution. He was born and educated at Constantinople and flourished probably between 380 and 440.

Soda. The substance known under the name of soda consists chemically of the carbonate of sodium, Na_2CO_3 , in combination with water. The ordinary washing soda has 10 molecules of water—i.e., $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$ —but loses some of it when exposed to the air. The carbonate of sodium is obtained, to a small extent, naturally, forming deposits upon the soil, and existing dissolved in Soda Lakes in Egypt and Hungary, and in the water of many geysers. Formerly also quantities of the compound were obtained from marine vegetation under the name of barilla; the greater quantity, however, is obtained by artificial preparation from salt by one of two processes: (1) the Leblanc; (2) the ammoniacal process. In the first, the salt is heated with sulphuric acid in a furnace constructed for the purpose; sodium sulphate and hydrochloric acid result—



The sodium sulphate known as salt cake is then powdered, mixed with powdered limestone and coal, and heated strongly in another furnace. The fused mass, known as black ash, consists of soda and calcium sulphide, and from it the soda is dissolved out by warm water and recrystallised. In the ammoniacal process ammonia gas and carbonic acid are passed into a strong solution of brine, when bicarbonate of soda and ammonium chloride result, the former being converted into sodium carbonate by heating, and from the solution containing the ammonium chloride the ammonia is again evolved by the addition of lime. Soda crystals, $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$, crystallise as large, prismatic crystals of the Monoclinic system, and dissolve in 2 parts of water at 38°C . The anhydrous sodium carbonate is a white powder which fuses to a porcelainous mass at about 800° . The bicarbonate of soda, NaHCO_3 , forms a white powder which is not as soluble in water as the previous salt. Soda is very extensively used in a great number of technical and manufacturing processes as well as in pure chemistry. Thus it is an important adjunct in many metallurgical processes, is employed in the manufacture of glass, soap, and paper, and in the operations of bleaching and dyeing.

Soda, CAUSTIC. [SODIUM.]

Sodium (chemical symbol, NA; atomic weight, 23). Although not occurring naturally in a free state, this metal is, in combination, one of the most abundant of the elements. As common salt it occurs largely dissolved in sea water, salt lakes, and in saline deposits; it is found as nitrate in deposits on the soils in Chile and other countries, and occurs also naturally as carbonate, phosphate, and borate. The silicate exists in many rocks and minerals, being an important constituent of the micas. It is also found in many plants, particularly in marine vegetation. The metal itself was first prepared by Sir Humphry Davy, who obtained it in 1807 by the electrolysis of the fused hydrate. It is now manufactured by strongly heating a mixture of carbonate of soda and charcoal in iron retorts, recent years having brought great improvements in the details of the process. It is a silver-white metal, soft enough to be easily cut by a knife. It is a little lighter than water, having a specific gravity of .97. It melts at 97-60° C., and may be volatilised in absence of air, the vapour being of a blue colour. If exposed to the air, the surface of the metal immediately tarnishes and becomes covered with a coating of the hydrate. If placed upon water, it immediately melts into a small ball, which floats upon the liquid, decomposing it with the evolution of hydrogen— $2H_2O + Na_2 = 2NaOH + H_2$.

The substance NaOH which is formed is known as sodium hydrate or caustic soda and remains dissolved in sea water, to which it imparts powerful alkaline properties. It is a white solid which is prepared usually by the action of milk of lime upon a boiling solution of sodium carbonate. It is a strong caustic and alkali, and is extensively used for technical, chemical, and manufacturing purposes. Sodium forms two oxides, which are, however, unimportant. Among its salts, however, are many important compounds. The carbonate is known under the name of soda, and the nitrate forms the compound Chile saltpetre. This silicate is soluble in water, and is known as soluble glass, being employed for fire-proofing, etc. The phosphate is important chemically, and the borate [BORAX] has many applications. The soaps are also but sodium salts of certain organic acids, while common salt is the chloride of sodium, NaCl. The metal itself is used in the preparation of other elements, notably aluminium, which has become cheaper than it used to be in consequence of the improvements in the processes of obtaining sodium.

Sodom, the chief of the Cities of the Plain, was according to the Hebrew Scriptures, destroyed, along with Gomorrah, Zeboim, and Admah, by fire from heaven as a punishment for its vices, Lot and his family alone escaping. The site is supposed to be marked by the Dead Sea, called by the Arabs "the Sea of Lot." In the light of modern criticism the story of the destruc-

tion of the cities is to be regarded as a folklore myth, there being allied legends in the mythology of several ancient peoples and even in Wales, where meres have been formed, according to popular tradition, by the subsidence of cities whose bells may still sometimes be heard pealing merrily. In most myths the cities appear to be destroyed by water. Had the destruction of Pompeii and Herculaneum occurred in the infancy of the historic period, or in the prehistoric period itself, it is easy to understand how such an awful catastrophe would impress popular belief and be embodied in tradition, which would probably read into the calamity some condign punishment decreed by Fate for widespread wickedness.

Sodom, APPLE OF. Josephus, referring to the Dead Sea, on which the country of Sodom borders, speaks of the ashes produced in the fruits of the region. It is supposed that he alluded to the fruit of the ocher tree, called by Hasselquist (1763) *Poma Sodomitica*, which grows plentifully in this district and near Jericho. He said that when attacked by an insect the inside was gradually turned into dust, the skin remaining intact like a shell and of a beautiful colour. According to Canon Tristram, the tree is from 12 to 15 feet high, and the fruit, about the size of an average apple and bright yellow, hangs in clusters of three or four close to the stem. It bursts readily when mature and is preyed on by a large black and yellow cricket. "Dead Sea fruit" thus came to have a figurative meaning, implying what is fair to the eye but nauseous to the palate. Lord Byron expressed this in a passage in the third canto of *Childe Harold's Pilgrimage*:—

"Like to the apples on the Dead Sea's shore
All ashes to the taste."

Sofia, or SOPHIA, or TRIADITZA, the capital of the principality of Bulgaria, near the left bank of the Isker, a tributary of the Danube, about 315 miles W.N.W. of Constantinople. It takes its name from the mosque of Sophia, once a Christian church erected by a Byzantine princess of this name and now in ruins through an earthquake. The town stands on a plateau on the north flank of the Balkans, and has a severe winter climate. The route from Belgrade to Constantinople passing through it brings a considerable trade, and there are some local industries, such as silken and woollen manufactures, tobacco, pottery and leather. The principal buildings comprise the mosque of Buyuk-Jami, the Prince's palace, the university, founded in 1888, the cathedral of St. Alexander and Parliament House. It is the seat of a Greek metropolitan and a Roman Catholic archbishop and became the capital in 1868. It was the Sardica of the Romans, the capital of Dacia Ripensis and the seat of a Church Council in 343. It was plundered by the Huns, captured in 809 by the Bulgarians, who kept it till about 1380, when

it fell into the hands of the Turks by whom it was retained until the creation of the principality of Bulgaria (1878). Pop. (1900), 67,920.

Soft Water, water almost entirely free from lime or magnesia salts and thus readily forming a lather with soap without leaving a curd-like sediment. On this account it is the ideal water for laundries and wash-houses, but unfortunately cannot be "laid on" to order, since its nature depends upon the character of the beds in which it rises and the strata through which it flows.

Soho, a district in Central London, lying between Oxford Street on the N., St. Giles's-in-the-Fields on the E., Leicester Square on the S., and Berwick Street, or thereabouts, on the W. Its name is of uncertain origin, but, having been formerly known as Soho Fields, it is conjectured to have risen from "So Hoe!"—the huntsman's phrase in calling off the harriers after a run, this locality being sufficiently rural in the 17th century to have permitted of the sport of coursing. The chief feature of the district is Soho Square, which was begun in 1681 and named at first King's Square in honour of Charles II. The Duke of Monmouth's house stood on the south side and "Soho" was the cry of his followers at the battle of Sedgemoor in 1685. It is surmised that the name of the Square was changed by his admirers after the Duke's execution as a tribute to his memory. Other occupants of the Square were Alderman Beckford, Sir Clowdisley Shovell, Bishop Burnet, Sir Joseph Banks, Sir J. E. Smith and Dr. Robert Brown the botanists, and Thomas Barnes, editor of *The Times*. Before its removal to Burlington House the Linnean Society (founded in Gerrard Street in this district in 1788) was housed in the Square and in the north-western angle was opened, in 1816, Soho Bazaar, the first of its kind in England. The statue of Charles II. that used to stand in the middle of the Square was removed in 1876. For long a feature, and latterly an undesirable one, of the district was Newport Market where, on the strength of his father being a poulterer there, Horne Tooke told his schoolmates his father was "a Turkey merchant." In Gerrard Street John Dryden and Edmund Burke lived for a time, and at the "Turk's Head," at the corner of this street and Old Compton Street, Dr. Johnson and Sir Joshua Reynolds founded in 1764 the famous institution called The Club. It was in the same tavern, too, that the Society of Artists met who successfully petitioned George III. to establish a Royal Academy of Art. St. Anne's (1685), the parish church, contains the tomb of Theodore, the so-called King of Corsica, who died in 1756, and in the churchyard William Hazlitt was buried in 1830. Sir Samuel Romilly resided in Frith Street; Sir James Thornhill, the painter, whose daughter married William Hogarth, in Dean Street, and at the Royalty Theatre, in this street, poor Adelaide Neilson made her *début* as "Juliet" in 1865.

Greek Street received its name as the rendezvous of Greek merchants from the Levant, and Wardour Street became famous for its shops where old furniture (much of it manufactured for the purpose), bric-à-brac, and curiosities were sold. The district teems with French restaurants and shops of all kinds, especially laundries, kept by French people and might almost be called Little France. This settlement dates from 1685—a date of remarkable interest for Soho—when, on the revocation of the Edict of Nantes, Huguenots and other refugees—"aliens" whom it would have been a crime to exclude—sought, and not in vain, the hospitality of England and London.—Soho is also the name of a suburb of Birmingham and famous in the annals of industry as the place where Matthew Boulton founded his factory in 1762, being joined in partnership by James Watt ten years afterwards.

Soils, ORIGIN OF. The name "soil" is generally applied to the disintegrated surface of rocks penetrated, or at least penetrable, by plant roots. Soils may be of two widely different origins: they may be local—derived, that is, from the decomposition of the substratum; or they may be transported. As examples of the former we have sandy soils on sandstone formations and clays, not only on clays and slates, but also on chalk and limestone. In this last case the carbonate of lime, which forms the bulk of the underlying rock, may be entirely removed by the percolating action of water, the clay being merely an insoluble residue. On the Upper Chalk it contains flints. Transported soils are of three classes—eluvial, carried by wind, such as blown sand and loess; diluvial, carried by the ice of the Glacial Period, such as boulder clay and gravel, sometimes very chalky; and alluvial, carried by river-action, such as some sands and gravels and most loam or brick-earth. Soils often contain a considerable admixture of humus or decayed vegetable matter (leaf-mould), which in some cases constitutes what is known as black earth. Soils are commonly classified as rich or poor, according to the large or small proportion of this ingredient; and as stiff and cold, if mainly clay, or light and warm, if mainly sandy or calcareous.

Soissons (the Roman *Noviodunum* or *Civitas Sueessionum*), a fortified town of the second class in the department of Aisne, France, on the left bank of the Aisne, 56 miles N.E. of Paris. A flourishing tribal centre in Julius Cæsar's time, it played an important part under the early Frankish sovereigns, and after the death of Clovis gave its name for a century to a small kingdom, which was merged in Neustria about 613. The Counts of Soissons remained powerful vassals until the 17th century, and from them sprang, in female descent, the house of Savoy-Carignan. Christianity was introduced in the 3rd century by St. Crispin and St. Crispinian, who worked as shoemakers for a living and so became the patron-saints

of that craft. The town is well built and chiefly modern, but the cathedral (12th to 13th century), the abbey-church of St. Leger, the remains of the ancient foundations of St. Médard, and St. Jean des Vignes, are among the most interesting monuments in France. It is the seat of a bishopric. Soissons has stood half-a-dozen sieges, resisting the Allies in 1814 and the Germans in 1870, and has been the scene of several councils and congresses. It has tanneries, iron-foundries, saw-mills, and factories for the making of agricultural implements, candles, chocolate, bottles, flannels and blankets. Pop. (1901), 13,240.

Sokoto, a province of Northern Nigeria, in the Central Soudan, Africa, having Bornu to the E. and Gando to the W., the river Binué forming the southern boundary. It has been roughly conjectured to occupy an area of about 180,000 square miles, which is probably excessive. It is mostly a level country and is not generally well watered, but has for Central Africa a healthy climate. Rice, wheat, millet, maize and several vegetables are the principal crops. Cotton and indigo and shea butter are among the more valuable products. Iron is everywhere plentiful, and silver, lead and other minerals are known to exist. The mass of the inhabitants are Hausas, physically, mentally, and industrially the finest of the negroes. The history of the territory begins with the 19th century, when it composed the Great Fulah kingdom, founded by Othman, a capable Mohammedan fanatic. In 1882 it passed (with other territories) under the control of the National African Company, a British organization which in 1886 received a charter as the Royal Niger Company. When this charter was surrendered in 1900 to the Crown, Northern Nigeria was constituted and Sokoto became one of its provinces. The capital is Wurnu, some 25 miles N.E. of Sokoto, the former capital. The population has never been numbered, but is estimated at 10,000,000.

Solanaceæ, a considerable order of gamopetalous dicotyledons, comprising some 60 genera. They are mostly herbs or shrubs, more abundant in the tropics than in temperate latitudes, and in America than in the Old World. Their leaves, though truly scattered, are often geminate, owing to local want of separation between the stem and a petiole. The inflorescence is similarly often extra-axillary. The flowers are generally polysymmetrically and isostemonously pentamerous, i.e., there are five sepals, five petals, and five stamens, with two many-ovuled united carpels. There is little to separate the order from the more polysymmetric genera of Scrophulariaceæ, save its generally narcotic properties. It includes the genera Solanum, in which are the potato and the bittersweet, Capsicum, Nicotiana (the tobacco), Petunia, Hyoscyamus (the henbane), Atropa (the deadly nightshade), Lycopersicum (the tomato), etc. Economically, commercially and medicinally, therefore, it

would be quite impossible to exaggerate the importance of the order.

Solan Goose. [GANNET.]

Solano. [SIMOOM.]

Solar Microscope is really a form of lantern used for obtaining upon a screen immensely-magnified images of minute objects. It is necessary that a small object should be enormously illuminated, for the greater the magnification obtained the less bright is the image compared with the object. For this reason it is convenient, when possible, to use the rays of the sun. A plane mirror is so placed that it reflects the sun's rays down the tube of the instrument, and the tube is often conveniently fixed in a hole in the shutter of a window. These rays, being parallel, are refracted by a powerful convex lens of short focal length to its principal focus, near which the object is placed. The rays then pass through another convex lens or set of lenses, from which they diverge on to the screen. This arrangement can only be used for objects through which the light can pass; if opaque objects are used, a device is employed by means of which the sun's rays, after passing through the first convex lens, are reflected by a second mirror on to the back of the object, and thence proceed to the magnifying lenses as before. Since the sun's rays are seldom at our disposal, another source of light has frequently to be used; the most brilliant substitute is the electric arc, but, in the absence of this, the oxyhydrogen limelight is employed.

Solar System consists of the sun, the planets and their satellites, the planetoids, and such other masses of matter as are influenced in their motion by the attraction of the sun. Although the planets are popularly regarded as being affected by the sun alone, it must not be forgotten that every member of this system exerts an influence upon every other member, the amount of such influence depending only on the masses of, and distances between, the bodies under consideration. The Table on the next page contains a list of the principal members of the Solar System with a few numerical data. [PLANETS, PLANETOIDS, SATELLITES, SUN, MOON, EARTH, MERCURY, VENUS, MARS, JUPITER, SATURN, URANUS, NEPTUNE, ETC.]

Solder, an alloy which is employed for uniting together two metals. The alloy is one which fuses easily, and, when fused in contact with the metals, on solidifying adheres to both, and keeps them firmly fixed. It is necessary for soldering that the metallic surfaces be perfectly clean, the quantity of solder itself required being very small. For ordinary purposes solder consists of an alloy of about equal parts of lead and tin. Fine solder contains double the quantity of tin, and coarse solder double the quantity of lead.

Sole, a fish belonging to the genus *Solea*, of the family of Flat Fishes, with about forty species from temperate and tropical seas. Like the

rest of the family, they are ground-fishes (and are therefore usually taken with the trawl), and feed freely on other fish. Most of them are found round the coast, and some enter fresh-water freely, though all breed in the sea. In England, however, they breed freely in the Arun, near Arundel, which is five miles from its mouth in the English Channel, remain in the river all the year and bury themselves in the sand in the cold of winter. Here they are often a pound in weight, occasionally as much as two pounds and somewhat thicker than Soles captured in the sea. Yarrell quotes the case of a Sole kept in a garden in Guernsey for many years, which became twice as thick as a sea Sole of the same size. The eyes are on the right side; the mouth is narrow, and twisted round to the left; the dorsal fin begins at the snout, and does not join the anal fin, and the lateral line is straight. The Common Sole (*Solea vulgaris*) is a well-known and highly-valued food-fish, and the largest of the British species. It is taken more or less all round the coasts, but the North Sea is the best fishing-ground. The usual length is from ten to twenty inches, but much larger specimens are recorded. One caught off Totnes, in Devon, was 26 inches long, 11½ inches wide and weighed 9 pounds. The colour above is brownish with black blotches. Other British species are the Lemon Sole (*S. aurantiaca*), the Banded Sole (*S. variegata*), and the Dwarf Sole (*S. minuta*), which is not known from any other waters.

oid in the coils of which a current flows acts in most ways like an electro-magnet. An iron core introduced into such a coil is sucked in, and tends to move until the centres of coil and core coincide, and the pull exerted by a solenoid on its core is used for actuating the mechanism of arc lamps and other apparatus, in which a greater range of motion is required than can easily be obtained with an electro-magnet.

Soleure, or SOLOTHURN, a canton in North west Switzerland, bounded on the N. by Basel, on the N.E. by Aargau, on the S.E. by Lucerne and on the S.W. and N.W. by Berne. It occupies an area of 302 square miles. All the northern surface is mountainous, the highest points being Hasenmatt (4,746 feet), Rötze (4,588) and Weissenstein (4,220), a resort for the air and whey cure. The Aare is the principal river. Soleure is exceedingly fertile, containing rich pastures, mines of iron and coal, valuable forests, and factories for glass, etc. Live-stock are raised and dairying is vigorously prosecuted. The majority of the inhabitants are Catholic. Pop. (1904), 105,284.

Soleure, or SOLOTHURN, the capital of the preceding canton, Switzerland, on both sides of the Aare, 18 miles E.N.E. of Berne. It was the Roman Salodurum and claims to be the oldest town north of the Alps, excepting Treves, according to the legend on the clock-tower, a building of the 5th century. The chief structures are the cathedral of St. Ours (Ursus), the arsenal, the antiquarian and natural history

| | Mean Distance from the Sun in Miles. | Periodic Time. | Diameter in Miles. | Time of Rotation on the Axis. | Mass compared with the Earth = 1. | Density referred to Water = 1. | No. of Satel- lites. |
|---------|--|-------------------|--------------------------|-------------------------------------|--|---|----------------------------|
| Sun | — | — | 852,584 | 25 days 10 hours | 354,986.0 | 1.87 | |
| Mercury | 35,000,000 | 88 days | 3,060 | 24 hours 5 minutes | .12 | 6.77 | 0 |
| Venus | 66,000,000 | 224 days | 7,602 | 28 hours 21 minutes | .88 | 5.80 | 0 |
| Earth | 92,800,000 | 365 days | 7,926.6 | 28 hours 56 minutes | 1.00 | 5.46 | 1 |
| Moon | — | 27 days 8 hours | 2,153 | 27 days 8 hours | .013 | 3.44 | |
| Mars | 130,000,000 | 686 days | 5,000 | 24 hours 37 minutes | .18 | 3.93 | 2 |
| Jupiter | 488,000,000 | 11.86 years | 88,200 | 9 hours 55 minutes | 316.08 | 1.31 | 5 |
| Saturn | 872,000,000 | 29½ years | 74,000 | 10 hours 39 minutes | 101.06 | .71 | 9 |
| Uranus | 1,754,000,000 | 83 years | 35,024 | ? | 14.29 | .82 | 4 |
| Neptune | 2,750,000,000 | 165 years | 36,620 | ? | 24.65 | 1.47 | 1 |

Solebay. [SOUTHWOLD.]

Solen. [RAZOR-SHELLS.]

Solenhofen, or SOLNHOFEN, a village of the district of Middle Franconia, Bavaria, on the Altmühl, 40 miles S. of Nuremberg. It is famous, in the first place, for its great quarries yielding the best, indeed the only good stone for purposes of lithographic printing, and, in the second, as having furnished the fossil remains of the reptilian bird called *Archæopteryx*. The rock is of Jurassic age.

Solenoid, in electricity, is a coil of insulated wire, usually hollow and cylindrical; its length is generally several times its diameter. A Solen-

oids, the town and cantonal libraries and the picture gallery. From the summit of the Weissenstein, three hours' walk to the north of the town, may be had one of the most perfect views of the whole Alpine Chain from Tirol to Mont Blanc. Soleure joined the Swiss Confederation in 1481. Pop. (1900), 10,100.

Sol-fa, from the Do, Re, Mi, Fa, Sol, etc., of the musical scale, denotes generally music or notes without text or fixed time, used merely to exercise the voice and test musical knowledge—in fact, the art of reading music. The chief systems are the fixed Do system, advocated by John Hullah (1812-84), the changeable Do system, and the Tonic Sol-fa.

Solicitor, the designation of a legal practitioner in the Courts Superior and Inferior of England. It was formerly restricted to practitioners in the Court of Chancery, "attorney" being the designation of a common law practitioner. By the Judicature Acts the term solicitor applies to all divisions of the Supreme Court. Solicitors are required to take out an annual certificate (£9 for London practitioners; £6 for country practitioners); half these amounts only are payable during the first three years of their practice. Previously to being articulated they have to undergo what is known as the preliminary examination, which deals with the several branches of general knowledge. Midway in their service (which is five years, except for university graduates when it is three years only) they have to undergo an intermediate examination, and before being admitted to pass the final examination in the several branches of law £80 stamp duty is paid on the articles of clerkship (formerly it was £120), and somewhat heavy fees on their admission to practice. Solicitors are "officers of the court," which barristers are not. They (solicitors) are under stringent rules as to practice, and their conduct is subject to inquiry and control, the Incorporated Law Society having jurisdiction to consider and report to the courts thereon. In cases of flagrant misconduct they are liable to be struck off the rolls of the court; in lesser cases to suspension from practice for a certain term, and to costs occasioned by their misconduct. Their costs are subject to taxation by officers appointed for the purpose—in the Supreme Court the masters—and if a sixth part be taken off the solicitor has to pay the costs of taxation. This rule, however, only applies to costs between "solicitor and client," as it is termed, not to "party and party" costs.

Solicitor-General, a very important law officer of the Crown, ranking in England next after the Attorney-General, his functions being political as well as legal. Like the Attorney-General, he is not in the Cabinet, but changes with the Government of the day. He is almost always a member of the House of Commons, and acts as the deputy or assistant of the Attorney-General. He is usually knighted soon after his appointment, and succeeds the Attorney-General on a vacancy in that office. In Scotland he ranks next to the Lord Advocate, whom he assists in Crown business, prosecutions and in other respects. In the United States he is the second officer in the Department of Justice, and assists the Attorney-General, whose place he occupies *in absentia*. In some of the States of the American Union the term Solicitor-General describes the principal law officer, while in others the term Attorney-General is used.

Solifuga, or FALSE SPIDERS, a group of Arachnida, the members of which somewhat resemble the spiders in general appearance, but have a segmented abdomen, that is, the cephalothorax

is represented by the head and three thoracic segments. The head has two large ocelli and a pair of huge pincer-like chelicerae. They have two pairs of palpi, which are as long as legs and look like them, but the apical joint has no claws. Each of the thoracic rings is furnished with a pair of legs, so that the creature appears to have five legs on each side, though in reality only three, the palpi being carried in front and serving as feelers. There is but one family, the Solpugidæ, common to the warmer regions of both hemispheres, but more numer-



GALRODES ARANEOIDES.

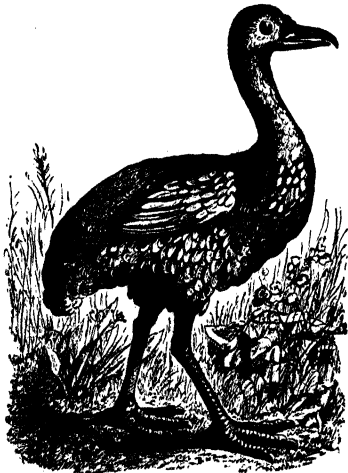
ous in the Old World than in the New. They frequent desert places and hide by day in crevices, or under stones, or in cavities which they have hollowed. India, Persia, Central Asia, Arabia, North Africa, Central America and the West Indies are their principal habitat. The best-known species, *Galeodes araneoides*, occurs in the Russian and Asiatic Steppes and possibly in Africa, Egypt and elsewhere. It is two inches long. If it comes in contact with anything in its nocturnal rambles it is said to emit a phosphorescent light. Should this be edible, it attacks it ferociously and soon kills it with its powerful nippers. It will devour a lizard half as large again as itself, and attack fearlessly young musk rats and bats and even try conclusions with a scorpion which, however, is a match for it if attacked in front. They also fight among themselves and eat the slain, but the females exhibit considerable care for their young. Old writers went so far as to say that parts of India had been deserted by the people through fear of these animals. Their bite seems to cause pain, temporary paralysis, bad headaches and fainting fits. Camels and sheep when severely bitten sometimes die. Since they frequent the reeds and sedges which are used by the Kalmucks and other nomads in the construction of their summer dwellings, they are readily introduced into the huts and thus are able to inflict injuries on human beings. It is not clear, however, that their bite, in spite of the serious symptoms it gives rise to and the inconvenience it occasions, is fatal to man. Some

35 species have been described, all very similar in structure and habits.

Solihull, a town of Warwickshire, England, 6½ miles S.E. of Birmingham, not far from the borders of Worcestershire. The church of St. Alphege, a large cruciform building, excepting the west end of the nave and the south aisle (which are Late Perpendicular), is a good example of the Decorated style. The Rev. Dr. John Feckenham (born Howman, ?1518), who was rector for ten years, was afterwards Dean of St. Paul's and Abbot of Westminster, being the last mitred abbot to sit in the House of Lords. He died a prisoner in Wisbech Castle in 1585. The Grammar School founded by Richard II. was reorganized in 1879. Its most distinguished pupil was William Shenstone, the poet. Pop. (1901), 7,517.

Solingen, a town of Rhenish Prussia, Germany, near the Wupper, 13 miles S.E. of Düsseldorf. It is one of the principal seats of the iron and steel industry, being noted for its speciality in sword blades, which have been made since the 11th century, the manufacture having, according to tradition, been introduced during the Crusades by smiths from Damascus. Cutlery generally, scissors, surgical instruments, files and tools also are fabricated in vast quantities, many of the operatives working in their own homes. There are iron-foundries and cigar factories. Pop. (1900), 45,260.

Solitaire (*Pezophaps solitarius*), a great pigeon somewhat resembling the dodo though, owing



SOLITAIRE.

to its longer legs, not so heavy and clumsy-looking, formerly living in the Mascarene Isle of Rodriguez, in the Indian Ocean, to the east of Madagascar. It is believed to have become extinct in the 17th century, but was described

from personal observation in 1690-3 by François Le Guat (1637-1735), who, along with some companions, underwent severe hardships in an attempt to colonise the group of islands and who published in 1708 an account of his travels and adventures. Fortunately, in 1865, Professor Alfred Newton discovered bones enough to show that the description was correct. Since then other finds have made it possible to reconstruct the skeleton.

Solomon (Hebrew, "Man of Peace"), the son of David by Bathsheba, succeeded his father on the throne of Israel about 1015 B.C., being then eighteen years old. He began his reign by putting to death his brother Adonijah, and Joab, and by banishing Abiathar. He married a daughter of Pharaoh, allied himself with Tyre and other neighbouring nations, and set about the promotion of the political and commercial welfare of his country. The Temple was begun in 1018, and completed in seven years, and a palace was also built in Jerusalem, the walls and fortifications of which city were constructed anew. The naval power of Israel appears to have been vigorously developed. He devoted much attention to natural history, and even to the black art, if Arabian and Talmudic traditions may be credited. Many literary works were attributed to him; but, with the exception of Proverbs, it seems probable that he had no part in these compositions. Ecclesiastes and the Song of Solomon undoubtedly belong to a later date, as does the Psalter bearing his name. Solomon died in his fifty-eighth year.

Solomon Islands, a group in the South Pacific lying N.W. of the New Hebrides, and S.E. of New Ireland, and extending in a double line for 600 miles, between the fifth and tenth parallels of south latitude. Several members of the group are of large size, Bougainville, Malaita, Isabel, Choiseul, Guadalcanar and San Christoval being the chief, the smaller islands numbering more than twenty. They are of volcanic origin, with fringing growths of coral, and Guadalcanar contains an active volcano. The central peaks attain a height of from 4,000 to 10,170 feet in Mount Balbi (Bougainville), and the soil is fertile and well watered, the chief products being sweet potatoes, bananas, pine-apples, coffee and cocoa. The exports also include tortoiseshell, sandalwood, ivory and nuts. Owing to the excessive rainfall the climate is unhealthy on the coasts, which are indented with many commodious bays. The natives belong to the Melanesian race, and present several marked characteristics. Bishop Patteson was the first who succeeded in establishing an influence over them. Forced labour for the Commonwealth of Queensland was obtained from the group, but the recruiting ceased in 1903. Discovered by Mendana in 1568, they were re-discovered by French and British sailors in the latter half of the 18th century. By the treaty of November 14th, 1899, part of the group, in-

cluding Bougainville and Buza, was assigned to Germany, and the remainder to Great Britain, including Guadalcanar, Malaita, Isabel, Kausagi and Choiseul. The area of the British section is estimated at 8,357 square miles, that of the German at 4,200 square miles. Pop. of British section (estimated), 150,000; of German, 45,000.

Solomon's-Seal (*Polygonatum*), a genus of liliaceous plants which derive their scientific name from their many-knee'd fleshy rhizomes. These give off tall, slender, drooping annual branches, bearing sessile broad leaves, either in two rows or in whorls, and axillary clusters of greenish-white flowers resembling bunches of seals hanging from a fob. The flowers are succeeded by bluish-black, berry-like fruits. There are three British species; but they are not common.

Solon, a descendant of Codrus and kinsman of Pisistratus, was born at Salamis about 638 B.C. Returning to Athens after a long voyage, he found the state torn by factions, undermined by the system of slavery for debt, and preyed upon by Megara. By a poem he stirred the citizens to recover Salamis, and was rewarded by being appointed archon. He at once set to work upon the reforms with which his name is associated. He wiped off all existing mortgages, classified the citizens according to property, gave votes to all, but limited the exercise of high office to the wealthiest, established trial by jury and the elective council of 400, strengthened the aristocratic Senate or Areopagus, invited foreigners to settle as "metoikoi" under the protection of citizen patrons, regulated education and introduced many social restrictions. He then bade farewell to his country for ten years in order to give his constitution time to get into working order. He visited Egypt, Cyprus, and Asia, and came home to find the old evils cropping up once more and the tyranny of Pisistratus imminent. Between the latter and Solon there seems to have been some sympathy, though the lawgiver objected to absolute government. Herodotus's story of his visit to Croesus, King of Lydia—to whom he said, "Pronounce no man happy until we have seen his death,"—has been declared apocryphal on the ground that Solon's travels were ended before Croesus's reign began. Solon died at the age of eighty before the new dynasty had fully come into power. Fragments of his poems have come down to us.

Solothurn. [SOLEURE].

Solo Whist, a variety of whist played by four persons with an ordinary pack of 52 cards, though, as the name suggests, greater opportunity is afforded for single-handed play than in the older game. Usually the deal at the beginning is assigned to the player who holds the lowest (ace counting as one) of the first four cards dealt out (in some companies, though the reason is hard to discover, the deal is

allotted to the player who receives the first Jack dealt out). There are no partnerships excepting in the declaration known as "Marriage," but there is informal partnership or combination amongst the other players against the person who has made a single-handed call. It is customary to play for money, but the stakes in that case should be kept as low as possible, else the temptation to gamble will be great. Notwithstanding this, money stakes are not at all necessary, counters leading to quite as good a game. Two packs are generally employed to save time, one being shuffled for the next round by the player opposite to the dealer, whilst the other is being dealt. Nevertheless, with a view to affording reasonable opportunities for a declaration, it is not thought desirable to shuffle the pack quite so thoroughly as in Whist, in which it is proper to endeavour to eliminate the element of mere luck. The deal having been settled as described for the first hand (in succeeding hands the deal passes to each player in turn), the dealer deals out the cards three at a time, starting with the player on his or her left, for four rounds and the last four cards one to each player, the last card being turned up as "trumps" in the meanwhile, pending any declaration that may be made. The ace is the highest card and a player must follow suit if he can. The player on the dealer's left has the first call. He may make one of several declarations or elect to pass; in the latter event the call will belong to the next player and so on in rotation. The following are the usual declarations, beginning with the highest, which takes precedence over all:—"Abundance Declarée," "Abundance," "Misère Ouvert," "Misère" (or "Misery"), "Solo," "Marriage" and "General." In order to win "Abundance Declared" the player must make every trick—an exploit which is so rarely possible that the call is never heard. To make "Abundance," a player must score 9 tricks out of the 13, the other players doing their best to prevent him from succeeding. He is entitled to choose his own suit for trumps, but should he elect to go on the suit of the turned-up card, he has the option of doubling the stakes, provided he announces his intention before a card has been played. The lead always falls to the player on the dealer's left and this must constantly be kept in mind in making a declaration, since the declarer cannot get his own game on until he has won a trick. It is clear that he must be overwhelmingly strong in one suit (which he will, of course, make trumps) and should also be very strong in one or two others, if he is to win at least 9 tricks. If he hold the six highest Hearts (making this trumps), the ace and Queen of Spades, the King and Queen of Diamonds, and the 10, 9, and 5 of Clubs, he might get "home," provided he contrive to let the lead in Spades come from the player on his left, in which case he will hold the two master cards (ace for the King and Queen for the Knave), but otherwise it is very doubtful

whether even with an apparently powerful hand he will get "home." The golden rule always is for the declarer, whatever the call, to get out the trumps the moment he secures the lead. Of course the rest will avoid trumps, in the hope of being able to use them in trumping a strong card in the declarer's off-suits. If "Abundance" is made, the declarer will receive (the writer preferably assuming the stakes to be little more than of nominal value) 4d. from each of the other players and 4d. for every trick made over 9. If "Abundance" fail, the declarer must pay 4d. to each of the other players. In "Misère Ouvert" the declarer will play to the first card led and then expose his hand on the table, playing the remaining 12 in view of his or her colleagues. This, too, is a call scarcely ever attempted. In "Misère," the next highest call, there are no trumps, and the declarer must not take a single trick. If he succeed, he will receive 3d. from each player, and if he fail, he must pay 3d. to each. For such a declaration a wretched hand is a *sine quâ non* (hence the name of the call), but a player holding an ace or King that is covered by four or five low cards of the same suit may risk the declaration, because he will have a good chance of throwing the ace or King away on a suit of which he has none or only one. For example, should he hold ace, 8, 6, 4, and 2 of Hearts and no Spades, or only one, he will play the ace the first or second time Spades are led. The danger is that some one may hold more Hearts than he has and by constantly keeping the lead may at last force him to take the trick with his ace and so lose. In "Solo," the next highest call, the declarer must make at least 5 tricks, the turned-up card indicating the trump suit. Comparatively speaking, this is an easy call, since the presumption is that no one will make it who does not think he sees his way to a sure 5, and is overpaid at 2d. for the "Solo" and 4d. for every trick made in excess of 5. Failure to make "Solo" involves the declarer in a payment of 1d. to each of the rest of the players in addition to 1d. for every trick below the necessary 5. "Marriage" is the only declaration involving an active partnership. The turn-up is the trump suit. If, for instance, the player on the dealer's left think he holds four certain tricks and a possible fifth, he will say, "I propose." The players, in rotation, have the option of taking him in the words, "I accept" (vulgarly, this call is known as "Prop" and "Cop"). The proposer and acceptor must take 8 tricks between them. If they succeed, they will receive 1d. for the "Marriage" and 4d. for every trick made in excess of 8—the proposer being paid by one of the opponents, the acceptor by the other. If they fail, the proposer must pay one opponent 1d. for the call and 4d. for every trick he is "down" (that is, below 8), and the acceptor must pay the other opponent similarly. A proposer should hold four certain tricks and a probable fifth: an acceptor three certain tricks

and a highly probable fourth. If an offer of "Marriage" be still unaccepted by the time the call has reached and been declined by the dealer, the player on his left has an option of acceptance. If the offer even then be refused, the proposer has the privilege of trying for "Solo," should he elect to run the risk. Should "Marriage" fail and no "Solo" be attempted, the situation will bring us to the remaining declaration, which is known as "General," and of which there are two kinds. In one variety there are no trumps, and whoever takes the last trick will pay 1d. to each of the other three players. Obviously, in such rounds, the policy is to play out the highest cards in the different suits and hold the lowest, care being taken, however, not to be left with the lead and the best sequence, even of low cards. But assuming that no declaration at all has been made the second sort of "General" will follow, meant doubtless to demonstrate the sincerity of the call, since everybody must hold bad hands if none be strong enough to warrant a declaration of any kind, for in this variety the player who takes the most tricks must pay 1d. to each of the players. Those players who care more for the stakes than for the game are accustomed to treat both sorts of "General" with contempt and, instead of playing to it, each person pays 1d. to a pool which is destined for the player who shall be the first afterwards to make a successful single-handed declaration. Either kind of "General," however, is well worth playing on its merits and should on no account be dropped. Players are expected to make a fair declaration according to their hands, because the rest of the company will be guided to some extent in their calls by the attitude of their neighbours. In a revoke the guilty player must pay the fees of the particular call in which the revoke was made. (In a "Marriage" the penalty falls upon the guilty partner only, not on both.) Should a player not only make his points but take every trick, he performs what is known as the "Grand Slam" and is entitled on that account to double stakes. In the opinion of many players of both games, Solo Whist is superior to Bridge.

Solstices are those points of the ecliptic which are farthest removed from the equator. When the sun in his apparent path reaches either of these points, he appears stationary; hence the term solstice, from the Latin *sol* and *stare*. He then progresses no farther towards the poles, but returns towards the equator. At these two points the sun is vertical at the Tropic of Cancer or Capricorn; hence the solstices are also known as the tropical points. The term solstice is often used to denote the time when the sun reaches the two points. Thus in the northern hemisphere the summer solstice will be June 21, and the winter solstice December 21. The Solstitial Colure is a great circle passing through the solstices, and cuts both the equator and ecliptic at right angles.

Solution. Most liquids have the power of dissolving substances—that is, causing such substances to liquefy—and no liquid has this power so much as water. The dissolved substance may be either a gas or a liquid or a solid. When a gas is absorbed by a liquid, the amount dissolved varies with the temperature of the solution, the pressure to which the solution is subjected, and the nature of the gas itself. It is usual for the amount of gas contained in a solution to decrease with rise of temperature; thus the oxygen and carbon dioxide contained in cold water are given off on boiling. William Henry (1774-1836) discovered the law connecting the amount of gas dissolved with the pressure, and this law states that the volume of gas absorbed varies directly with the pressure. Thus, if water at ordinary pressure—i.e., under one atmosphere—will dissolve one litre of a gas, it will also dissolve apparently one litre under a pressure of two atmospheres; but one litre of the gas under two atmospheres is equivalent to two litres under one atmosphere, so we see that in the second case twice as much gas has really been absorbed. The amount of any gas dissolved from a mixture is determined by the pressure of that gas alone, and the law of such absorption is known as Dalton's law of partial pressures. Usually a solid becomes more soluble in a liquid as the temperature rises; but there are a few exceptions to this, notably lime, which is much more soluble in cold than in boiling water. When the liquid will not dissolve any more of the substance, it is said to be saturated. In some cases, when a hot saturated solution is allowed to cool slowly without agitation, the solid is not precipitated, and hence the solution contains at the lower temperature more substances than it would dissolve naturally at that temperature. Such a solution is said to be supersaturated. It is in an unstable state, and generally slight agitation, or the addition of a grain or two of some solid, will cause solidification to occur so rapidly that a rise of temperature is at once observed. Sodium sulphate shows this phenomenon exceedingly well, and it generally occurs best with those salts which contain a large amount of water of crystallisation. When substances are dissolved in any solvent, the solution exhibits properties different from those of the pure solvent. Thus if a solution of sugar and water be contained in a tube, with what is known as a semipermeable membrane at its base, and this be placed in water, the solution rises in the tube, owing to the entry of water through the membrane, until a constant limit is reached. [Osmosis.] There is thus a head of solution indicating a pressure, and this is known as the osmotic pressure of the solution. Osmotic pressure might be measured in other ways, and by means of this experimental quantity Jakob Hendrik van't Hoff (b. 1852) found he could apply thermodynamics to solutions, and hence originated what is known as the new theory of solutions. For dilute solu-

tions at constant temperature it has been found that the osmotic pressure is proportional to the concentration, and further that the value of the osmotic pressure is the same as that which the substance would exert if it could be gasified and made to occupy (at the same temperature) a volume equal to the volume of the solution. It will thus be seen that in dilute solutions the dissolved substance behaves very much like a gas. It has been found also that the vapour pressure of a solution is lower than that of the pure solvent, and that the amount of lowering depends on the molecular weight of the dissolved substance. This causes the boiling-point to be higher, and the freezing-point to be lower, for a solution than for the solvent, and observations on these alterations of temperature are often used as a means of determining the molecular weight of a dissolved substance. It has been found that salts, acids, and bases give abnormally large values of the osmotic pressure and related properties; they behave as though more molecules were present than are actually there, and hence it has been suggested that these substances have really dissociated. Since those substances which exhibit these peculiarities are always found to be conductors of electricity, a theory of electrolytic dissociation has been largely accepted. In the case of a solution of hydrochloric acid, for example, Michael Faraday supposed each molecule consisted of two parts oppositely charged with electricity, thus $\overset{+}{\text{H}} \quad \overset{-}{\text{Cl}}$. These parts he called the ions, and the passage of the current was supposed to consist of the movement of the two ions in opposite directions. These ideas of Faraday's have been supported by many workers, and in 1887 Arrhenius published his hypothesis that in such solutions a portion of the molecules exists decomposed into ions even when no current is passing. It is not possible to expound this theory more fully here, but work done on solutions of many different electrolytes shows that, whatever may be the real state of an electrolyte in solution, the ion theory affords a trustworthy working hypothesis.

Solway Firth, an inlet of the Irish Sea, running inland, in a north-easterly direction, like a wedge and dividing the English county of Cumberland on the S. from the Scottish shires of Kirkcudbright and Dumfries on the N. It has a breadth of 26 miles at its mouth between Little Ross and St. Bees' Head, and diminishes to 2 miles at its eastern extremity, where extensive tracts of sand are exposed at low water. Its length is about 40 miles. The Dee, Urr, Nith, Annan and Sark, on the north, and the Esk, Eden, Ellen and Derwent, on the south, are the principal feeders. The shore turf is in great request for bowling-greens, owing to its springy nature and ability to stand wear and tear. A railway viaduct 1,960 yards long spans the tidal creek between Bowness and Annan. Solway Moss, 7 miles in cir-

cumference, the scene of the defeat of the Scots under Sir Oliver Sinclair in 1542—which is said to have broken James V.'s heart,—lies a little to the north-east.

Solyman II., SOLIMAN, or SPLEIMAN, surnamed "THE MAGNIFICENT," was born about 1490 and succeeded his father, Selim I., as Sultan of Turkey in 1520. Having made peace with Persia and quelled a rising in Syria, he directed his arms westwards, captured Belgrade and Rhodes, and ultimately pushed on to the gates of Vienna (1529), whence, after three weeks' siege, he had to retreat. He attacked Venice, but ultimately came to terms with Charles V in 1538. In 1534 he renewed the war with Persia, took Tauris and Bagdad, but was beaten before conquering Yemen. Tunis and Algiers and parts of Greece were added to his empire. In 1540 he again invaded Hungary and annexed the greater portion of it. Responding to the invitation of Francis I., he sent a fleet under Barbarossa to co-operate with the French against Charles V. A second expedition to Persia in 1547 resulted in the conquest of Georgia. From 1552 to 1562 he was engaged in fresh hostilities against Hungary, and in 1565, though he brought a vast armament against Malta, he failed to take the island. He died on September 5th, 1566, at Sziget whilst opening a new campaign against Hungary.

Soma, in Hindu mythology, is closely connected with Indra, as the deity of light and fire, inspiring courage, poetry and song, and bestowing long life, joy and immortality. At a later stage he is absolutely identified with the moon. In one of his aspects the god appears as the soma plant, a kind of milkweed, from which is extracted an intoxicating liqueur, used freely in the rites of this divinity. The beverage is prepared with mystic solemnities prescribed in many of the most ancient hymns of the Rîgveda-Sanhita, and the plant is itself made an object of worship.

Somali, a people of East Africa, whose domain comprises most of the eastern peninsula terminating at Cape Guardafui, and stretching from the Gulf of Aden south to the Juba river, with not very closely defined western limits towards Gallaland and Abyssinia. The Somali, who belong to the Ethiopic or eastern branch of the Hamitic family, intermediate between the Western Gallas and Northern Afars (Danakil), form three main divisions, with several important sub-groups, as under: (1) Hasiya (Mijertin, War-Sengali, Dolbohanti, Habr-Awal, Habr-Tol, Habr-Yunis, Issa, Gadibursi), from Tajurah Bay round to the Indian Ocean, and from the Gulf of Aden south to the central plateau of Ogaden; (2) Hawiya (Habr-Jaleh, Habr-Gader, Karanîlê, Rer-Dollol), Ogaden and Webi-Shebeli basin; (3) Rahanwin (Kalalla, Barawa, Wadan, Abgal), southern steppes, Juba basin. The type differs little from that of the Gallas, except that the Somali are taller (5 feet 10 inches to 6 feet), and darker (a deep

shade of brown), with smaller and longer heads, slightly arched nose, full lips, deep-set black eyes, long crisp black hair, slim extremities; but there is a strain both of Arab and Negro blood, causing considerable modifications in different districts. All are Mohammedans, and the little culture they possess, such as a slight knowledge of letters, and the national costume (a flowing robe of white cotton, clasped to the left shoulder), is entirely due to their Arab teachers. Beneath this outward varnish the savage instincts are still rampant, as shown in the prevalence of brigandage, lawlessness, tribal feuds, the vendetta, and a curious indifference to physical pain. The chief possesses little authority over the innumerable *riers* or *fakidas* (clans and septes), and even the so-called Sultans of the Hasiyas exercise scarcely any influence beyond their immediate surroundings. The coast people engage in fishing, navigation, and trade, or caravan leading. In the interior nearly all are nomads, and possess a fine breed of camels, noted for extraordinary staying power. By international conventions the Northern Somali have become British, the Southern Italian subjects. A rising under the Mullah took place in 1902, and a British force was despatched, but after considerable fighting the Mullah escaped, and the military operations ceased in 1904.

Somaliland, an area of Africa, which may be very roughly described as that portion of the continent lying east of the Juba, the meridian of 40° E., Abyssinia and Eritrea, bounded on the N. by the Gulf of Aden, on the E. and S. by the Indian Ocean, and on the W. by the Juba and Gallaland. It has been taken under the protectorate of several European powers, but their jurisdiction is practically confined to the coastal region and the immediate hinterland. In the north FRENCH SOMALILAND lies between the Italian colony of Eritrea and British Somaliland, extends inland for an average distance of some 56 miles, occupies an area of about 12,000 square miles, and has a pop. of about 50,000. The port of Obok was acquired in 1862, Sagallo and Tajurah were obtained in 1884, and Ambado was acquired in 1885. By agreement with Great Britain the territory was delimited in 1888, in which year Jibutî (15,000) port was established, afterwards becoming the seat of government, the territory being administered by a Governor and Privy Council. BRITISH SOMALILAND, extending from Lahadu, west of Zeila, to Bandar Ziyada, in 49° E., both on the Aden Gulf coast, and inland for distances varying from 40 to 200 miles, is administered by a Commissioner, who is also Commander-in-Chief. The area amounts to 60,000 square miles and the population 300,000. The boundaries of the protectorate were arranged with Italy in 1894 and in 1897 with Abyssinia, to which 8,000 square miles were then ceded in order that the Emperor might be in a position effectually to deal with the unruly tribes on his

southern borders. The chief town is Berbera (30,000), and the other large towns are Zeila (15,000) and Bulhar (12,000). The sole means of transport is by camels and donkeys. ITALIAN SOMALILAND extends from 49° E. on the coast of the Gulf of Aden, doubling Cape Guardafui and then proceeding southwards to the mouth of the Juba. It has an area of 100,000 square miles and a pop. of 400,000. Italy first obtained a footing on the coast in 1889, when the Sultan of Obbia placed himself under her protection and she proclaimed her protectorate over the Benadir coast from the Juba as far north as 2° 30' N., excepting the ports of Brava, Merka, Mogadisho and Warsheik, which belonged to the Sultan of Zanzibar. These she leased in 1893, in which year she took over the administration of the region. In 1905 she bought out the Sultan and then obtained sovereign rights. SOMALILAND has thus an approximate area of 172,000 square miles and a pop. of 750,000.

Somers, or **SOMMERS**, JOHN, LORD SOMERS, Lord Chancellor, was born at Whiteladies, Claines, near Worcester, England, on March 4th, 1651. He was educated at Worcester Cathedral School, private schools at Walsall and Sheriff Hales, and Trinity College, Oxford. He was called to the bar in 1676, and by dint of hard study soon became an expert. He was junior counsel for the Seven Bishops in 1688 and next year was elected M.P. for Worcester, a seat which he held till he was raised to the Woolsack. If he did not write the Declaration of Rights, he presided over the committee that drew it up. In 1689 he was made Solicitor-General and was knighted soon afterwards. Three years later he was promoted Attorney-General and on March 23rd, 1693, was appointed Lord Keeper of the Great Seal, and on April 22nd, 1697, Lord High Chancellor, being raised to the peerage by the title of Baron Sommers a few months later. During his official and political career he never intermitted his keen delight in letters, learning and art. In 1704 Jonathan Swift dedicated to him the *Tale of a Tub*, but, preferment not being forthcoming, ratted to the Tories and became his enemy. From 1699 to 1704 he also served as President of the Royal Society, and his opposition (1694) to the renewal of the Licensing Act was prompted by regard for the liberty of the press. Having been made to bear a larger share of the blame for the Treaty of Ryswick (1698) and the Partition Treaty (1699) than can be justly laid upon him, Somers grew unpopular and surrendered the Great Seal on April 17th, 1700. His enemies were not appeased, however, and demanded his impeachment, but he was ultimately acquitted on June 17th, 1701. This hostility was continued during the early years of Anne's reign, but he was virtually the head of the Whig party, and slowly but surely his influence reasserted itself. The burden of the defence of the Act of Union with Scotland was entrusted to Somers in the House of Lords and

in 1708 he became President of the Council. Though he was opposed to the impeachment of Henry Sacheverell, he was loyal to his colleagues and fell with them in 1710. In 1714 he accepted a place in the Cabinet without portfolio, but his health soon afterwards failed and he died at his villa near North Mimms, in Hertfordshire, on April 26th, 1716.

Somerset, a maritime county in the south-west of England, bounded on the N.W. by the Bristol Channel, on the N. by Gloucestershire, on the E. by Wiltshire, on the S.E. by Dorset, on the S.W. and W. by Devonshire. The area of 1,615 square miles consists of marshy levels on the coast, slaty cliffs to the east, and alluvial plains or valleys to the south, divided by the bleak ranges of the Mendip, Polden, Quantock, and Brendon Hills, and the plateau of Exmoor. The chief rivers are the Avon, Parret, Yeo and Axe. The soil is good in the lowlands, the Vale of Taunton yielding fine crops of wheat, barley, oats, turnips, mangolds and potatoes, and the pastures supporting large herds of cattle, whilst sheep thrive well on the hills. Horses and pigs are also raised in large numbers. There are extensive orchards of apples for the manufacture of cider. Some coal is found in the east, but the chief mineral resources are Bath-stone, slate, iron and lead. Woollen and linen goods, machinery, tobacco and snuff, bricks and tiles, gloves, lace, paper and Bath-bricks are the principal manufactures, besides brewing and printing. Bath (49,839), the capital, is famous for its waters, and other centres of population are Taunton, Bridgwater, Chard, Wells, Yeovil and Glastonbury. The Roman occupation was pretty thorough in this area and important remains are found at Bath, Ilchester and elsewhere. After the retreat of the Romans the district formed part of Damnonia, or West Wales, and is celebrated in the Arthurian legends. In religious history engrossing interest attaches to the Vale of Avalon and Glastonbury. During the Danish warfare Alfred the Great found shelter at Athelney. At the time of the Civil War the shire stood by the Parliament and Sedgemoor witnessed (1685) the last battle on English soil. Pop. (1901), 508,104.

Somerset, DUKE OF. [SEYMOUR.]

Somerville, MARY, writer on science, daughter of Vice-Admiral Sir George William Fairfax, was born at Jedburgh, in Scotland, in 1780. She taught herself mathematics, but her real progress in science began in 1812, when, having lost her first husband, Captain Samuel Greig, she married Dr. William Somerville, inspector of the army medical board. She acquired a deep knowledge of astronomy and physics, and was intimate with Laplace and other learned men. Her first work was a translation of the *Mécanique Céleste* (1831), and in 1834 appeared *The Connection of the Physical Sciences*, followed in 1843 by her *Physical Geography*, and in 1869 by *Molecular and Microscopic Science*.

She was elected an honorary member of the Royal Astronomical Society, and received a Civil List pension. She died at Naples on November 29th, 1872, and in her honour were named Somerville Hall and the Mary Somerville Mathematical Scholarship for Women at Oxford.



MARY SOMERVILLE.

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Somme, a department of France, bounded on the N. by Pas-de-Calais and Nord, on the E. by Aisne, on the S. by Oise, on the S.W. by Seine-Inférieure, and on the N.W. by the English Channel. It occupies an area of 2,443 square miles. The surface is generally level, but undulating in parts and composed of sand dunes off the coast. The chief river is the Somme, from which the department takes its name and which, rising in the department of Aisne, flows in a north-westerly direction to the English Channel, which it reaches after a course of 125 miles. Other streams are the Ancre, Avre and Selle (affluents of the Somme), the Authie and Bresle. The principal crops are wheat, oats, barley, potatoes, garden poppy and beet-root for sugar. Horses, cattle, sheep, pigs and goats are raised in great numbers. The leading industries are the spinning and weaving of linen, hemp, cotton, sugar-refining, distilling, peat-cutting, lock-making, tanning, paper-making and the fisheries. St. Valéry is a fashionable seaside resort. Amiens (90,758), famous for its cathedral and its velvets, is the capital. Pop. (1901), 537,848.

Somnath, or PUTTUN-SOMNATH, a decayed port of the Presidency of Bombay, India, on the south-western coast of the Kathiawar peninsula, the marine quarter, Verawal, bearing traces of its ancient fortifications and commercial prosperity. The place takes its name

from the great temple of Siva, the ruins of which attract many pilgrims. Mahmud of Ghazni, in 1024, carried off the famous gates, which are now at Agra. Pop. (estimated), 6,000.

Sonata, a musical composition, introduced and much used in the 17th and 18th centuries. It should have a single, common idea running through the movements, which are varied, and originally it was intended for one instrument, generally the violin, later the piano. If it is intended for more instruments than one, one instrument should always predominate in the same movement, and the others be looked on as accompaniments. Bach, Haydn, Mozart, Mendelssohn, Beethoven and Brahms are celebrated for their sonatas.

Song, a short poem, or set of words in rhythm, adapted to music. The song may be for a single voice, for a chorus, or a part-song, or all combined, and generally contains a story or sentiment, and should be directed to the emotions, sentiments, or passions. The national songs of England, Scotland, Ireland, etc., Dibdin's nautical songs, and the folks- and soldaten-lieder of Germany are good examples of what songs should be, as are also the short songs in Tennyson's *Idylls of the King*.

Songhay (SONRHAY), a historical people of West Central Sudan, whose empire, overthrown by the Moroccans in 1591, at one time comprised a great part of West Sudan and the Sahara, with Timbuktu and many other great cities. They still number about 2,000,000 along both banks of the Middle Niger from Lake Debo round to the Sokoto confluence, and at some points stretching as far as the Hombori Hills within the great bend of the Niger. The Songhay language, which is of Sudaneese type, but in other respects fundamentally distinct from all the surrounding forms of speech, is even still current in the Asben district, a proof of the former great extent of their empire towards the east. But nearly all are now subject either to the Tuaregs or to the Fulahs of Sokoto and Gando, or to the French since the occupation (1894) of Timbuktu. The culture is purely Mohammedan, but the type Negroid, that is, Negro much modified by Arab and Tuareg (Berber) interminglings.

Songka. [RED RIVER.]

Sonnet, a short poem of fourteen lines, generally containing a single idea or sentiment. It seems to have first appeared in Italy, perhaps in Bologna, in the 13th century, and later in other countries. The kinds are chiefly two: the simple stanza (as Shakespeare's), and the compound stanza (as Petrarch's). The simple stanza consists of three quatrains of lines rhyming alternately, and ending with a couplet; the compound of eight lines rhyming 1,4,5,8: 2,3,6,7: and six lines of two or three rhymes, varying in order. Among English writers of sonnets are Shakespeare, Drayton, Keats, Wordsworth, and Milton.

Sonora, a state of Mexico, bounded on the N. by the United States, on the E. by Chihuahua, on the S. by Sinaloa and on the W. by the Gulf of California. It covers an area of 76,900 square miles, being the second largest state of the Republic. The heights of the Sierra Tarahumare occupy the eastern surface, but the coastal land is generally level and fertile. The chief rivers from north to south are the Asuncion, Sonora, Matape, Magin, and Mayo and their affluents. The mineral wealth comprises gold, silver, copper, lead, iron, coal and graphite. The principal crops are cereals, tobacco, cotton, sugar-cane and fruit. Hermosillo (17,618), on the Sonora, 65 miles from the coast, is in railway communication with Arizona, California and New Mexico. Pop. (1900), 221,682.

Sontag, HENRIETTE, COUNTESS ROSSI, singer, was born at Coblenz, in Germany, on January 3rd, 1806. Her parents being actors she was engaged on the stage from her earliest years, but after her father's death studied at the Conservatory of Prague. Soon after her *début* at the age of fifteen she was engaged at the Opera of Vienna, where she sang in numerous rôles of German and Italian operas. At her first appearance in Berlin (1824) she achieved an electric success and was appointed Singer to the Court. She was enthusiastically received at Paris two years later and in London in 1829, the rivalry between her and Malibran evoking extraordinary demonstrations. Soon after her marriage (1829) to Count Rossi, Secretary of the Sardinian Legation at Berlin, she retired from the stage, but consented to appear in Rossini's *Semiramis* at Berlin in 1830, when she won another triumph. Family reverses having obliged her to return to the stage in 1848, it was soon apparent that her beautiful voice and gracious presence were as charming as ever, and her renewed career in France, Germany and Great Britain was marked by a succession of brilliant performances. Unfortunately during her tour in North America she was seized with cholera and died at Mexico on June 17th, 1854. One of the most gifted singers the operatic stage has ever known, as an actress she was somewhat deficient in the dramatic power needed for tragic parts.

Sonthals (SANTÁL), a large Kolarian nation of East Central India in Baghalpur, north-west of Murshedabad, reaching from the Daman-i-Koh (Rajmahal) Hills on the right bank of the Ganges southwards to about 24° N., north-west of Calcutta. The chief tribal divisions are Saran, Murmu, Marli, Kisku, Basera, Karwar, Choral. Many of the Sonthals engage themselves as coolies in the British colonies, and large numbers have become Protestants. Their language, reduced to written form by the missionaries, and spoken by over 1,000,000, is the best known, the most highly inflected, and by far the most important of all the Kolarian languages. Ethnologically considered, their type seems more Dravidian than Kolarian, and

they present an almost round face, large mouth, tumid lips, flat forehead, moderately prominent cheek-bones, coarse, black, lank hair, short stature, robust constitution, and show a remarkable immunity from fever in malarious districts. This characteristic enables the Sonthals to work on plantations where the climate would be fatal to almost any other race.

Soochow, or SUCHOW, a city in the province of Kiang-Su, China, about 55 miles W.N.W. of Shanghai, and close to Lake Tai-hu and the Imperial Canal. Outside the walls, which make a circuit of ten miles, are populous suburbs. The Taeping rebels took the place in 1860, and it was recovered in 1865 by General Gordon. It had suffered incalculable damage during the interval, being in parts reduced to ruins. It contains several pagodas, of which the nine-storeyed one of the northern temple is one of the finest in the empire. The city is the headquarters of the silk manufactures, but its artisans are adept also in carved articles and metal, lacquer and glass wares. Pop. (estimated), 500,000.

Sophia Dorothea of Zell, the only daughter of Duke George William of Brunswick-Lüneburg-Zell (or Celle), was born on September 15th, 1666. At the age of sixteen she married Prince George Louis of Hanover, afterwards George I. of England, and bore him a son and a daughter, the first becoming George II., whilst the latter was mother of Frederick the Great of Prussia. In 1694 Sophia was discovered in an intrigue with Count Philip von Königsmark, was divorced, and passed the rest of her days imprisoned at Ahlden, where she died on November 13th, 1726.

Sophists, primarily professional teachers of rhetoric and other branches of learning in Greece in the latter part of the 5th century B.C. Professing as they did to teach the newest learning, they (or rather some of the most conspicuous of them) came to appear as a kind of sect or school of philosophers representing and intensifying the sceptical tendencies of the time. The earlier Sophists were declamatory and rhetorical: the later perhaps imitated Socrates' dialectic. They were renowned for their power in rhetoric and grammar, both of which subjects they taught for pay. Much of what we know of them is derived from Plato and Aristotle, who judged them by a somewhat transcendental standard. Protagoras, Gorgias, and Prodicus were among the leading Sophists.

Sophocles, the Greek tragic poet, was born in the district of Colonus, a suburb of Athens, about 495 B.C. Very little is known of his life. Tradition affirms that he led the chorus of boys who chanted in celebration of the victory of Salamis (480), and allusions in Aristophanes prove that he died not long before 405. He discharged his ordinary civic duties, appears to have served with Pericles as a general in

the Samian War, was of a genial temper, and somewhat susceptible to the tender passion, and is rumoured to have become miserly in his later years. The well-known story of his reciting a passage of the *Œdipus Coloneus* to prove his capacity in extreme old age for managing his property rests on slender evidence. It is said that he produced his first tragedy in 468, wresting the prize from *Æschylus*, and he was twenty times successful, producing more than a hundred pieces, only seven of which are extant, namely, *Œdipus Tyrannus*, *Œdipus Coloneus*, *Antigone*, *Electra*, *Ajax*, *Philoctetes*, and *Trachiniae*. He shows a distinct advance over *Æschylus* in dramatic construction, simplicity of language, and mastery of metre, but lacks the tragic intensity and lyrical power of the older poet. His patriotism, though noble, is less strenuous. On the other hand, he never sinks into the sickly and monotonous sweetness of *Euripides*. Consummate art marks every line of his works, and in this respect he still remains without a rival.

Sorbonne, THE, is the outcome of a theological institution founded in the University of Paris in 1257 by Robert de Sorbon (1201-74), chaplain of Louis IX. It was intended for secular priests, who there studied and taught theology, and its members gained a great reputation, so that the Sorbonne had much influence in the ecclesiastical and social world. Cardinal Richelieu rebuilt it in 1626 and following years. It was suppressed and disendowed at the Revolution (1792), but was revived in 1821, when the faculties of theology, science and literature of the University of Paris were installed there along with their libraries. The new buildings date from 1889 and retain the name. The church, which contains the tomb of Richelieu, its founder, was preserved in consequence of its architectural beauty. The greatest honour in the history of the Sorbonne was its introduction of printing into France in 1469. Its greatest shame were its persistent persecution of all new thought and its thick-and-thin support of the vilest measures to crush it.

Sorcery. [MAGIC; WITCHCRAFT.]

Sorel, AGNES, mistress of Charles VII., was born at the castle of Fromenteau, near Villiers-en-Brenne, in the Touraine, France, about 1422. She was of good parentage and became attached to the wealthy Duchess of Lorraine, Isabel, wife of René of Anjou. Marie of Anjou, René's sister, had married Charles VII. and thus there was considerable intercourse between the families. In 1441 "the Maid of Fromenteau," as she was called, was introduced to the King, who was captivated by her beauty and induced her to become his mistress. The *liaison*, at first secret, was known in 1444, and from that time till her death at Anneville, near Jumièges, on February 9th, 1460, Agnes never left the King. The maid of honour of the queen, she was treated

with the utmost courtesy and respect, and, in fact, society was scandalised at seeing, for the first time, a kind of official position at Court assigned to the King's mistress. Agnes's chief merit was that she had the sense to act with and not to thwart the distinguished men whom Charles VII. was privileged to summon to his counsels; but the notion, once current, that she was the King's good genius, a sort of second Joan of Arc, has been exploded by the researches of G. du Fresne de Beaucourt in *Revue des Questions Historiques* (1866).

Sorghum, a genus of grasses cultivated, under the name of millet, guinea-corn, durra, etc., in tropical countries and a few temperate climates, and employed for various purposes. Among the Shaker communities of the United States sugar is manufactured from the stems. The grain is employed as food for poultry, horses, etc., and in India is eaten by the poorer classes. The stalks of the grain-bearing panicles are made into brooms, clothes-brushes, etc.

Sorrel (*Rumex scutatus*), sometimes distinguished as French sorrel, is a hardy perennial, native of France and Italy, introduced into the country as a vegetable in 1596. The blunt hastate glaucous leaves are more fleshy and less acid than those of the Common Sorrel (*R. acetosa*), a British species that was formerly used in the same manner. Sorrel is rich in oxalic acid, and is considered a valuable antiscorbutic; but it is more eaten in France, where it is used in salads and soups, than in England.

Sorrento, the ancient Surrentum, a town of the province of Campania, Italy, delightfully situated on the southern horn of the Bay of Naples, 13 miles S. by E. of Naples. Embosomed in groves of orange and lemon trees and blessed with a mild and healthy climate, in the age of Augustus it was a grander city than Naples. Its former glory seems to have wholly passed away, although its natural charm and beauty still give it deserved vogue as a health and holiday resort. Its traditional industry is wine-making and its wines are now in local repute. It has manufactures of silk. Torquato Tasso, author of *Aminta* and *Gerusalemme Liberata*, to whom there is a statue in the Piazza, was born here in 1544. Pop. (1901), 8,933.

Sortes Virgilliane, a method of divination which consisted in opening by chance on a passage of Virgil, and taking the passage so found as prophetic. The ancients practised it, and in later times Charles I. and Lord Falkland found in this way a forecast of their eventual fate. Another method was to write on slips a certain number of verses from a particular author, deposit the slips in an urn and then draw them out by lot. From the nature of the contents of the extract selected was to be inferred some hint as to the fortune, good or bad, of the consulter of the oracle.

Though condemned by the Christian Church, the same method of divining was applied to certain religious books, and the Bible is even now resorted to by some for the same purpose. Such lots have been actually called *Sortes Biblicæ*, or *Sortes Sacræ*.

Sothorn, EDWARD ASKEW, actor, was born at Liverpool on April 1st, 1830, and was very early attracted to the stage, appearing at Boston, United States, in 1851. For several years, however, he failed to distinguish himself, but in 1858 he at length made a great hit at New York as "Lord Dundreary" in Tom Taylor's *Our American Cousin*, practically creating the character. In 1861 he brought the play to England, and acted it many hundreds of times at the Haymarket and in the provinces. On its production in London it ran for 496 consecutive nights and brought into vogue the long, flowing Dundreary whisker and the Dundreary garb (frock coat, white vest and shepherd's-tartan or other light trousers and eye-glass). This was his substantial success; for, though he obtained some popularity in *David Garrick*, *Brother Sam*, and *The Prompter's Box*, he never quite got the same hold over the public. In 1878 he returned to England after an absence of some years in the United States, and died somewhat suddenly in London on January 21st, 1881.

Soubise, BENJAMIN DE ROHAN, DUC DE, soldier, the second son of René II., Vicomte de Rohan, was born at La Rochelle, France, about 1589, and began a military career under Prince Maurice of Orange in the Netherlands. In 1621 he, with his brother, took the command of the forces of the Huguenots against Louis XIII., conducting operations, with more or less success, in the west and along the seaboard, his most brilliant achievement being the cutting-out of the French fleet in the Blavet. From 1626 to 1628 he had charge of the defence of La Rochelle and, had his counsels prevailed, the abortive expedition against the *Île de Rhé* might have had another issue. On the failure of his hopes he withdrew to England and died in London on October 9th, 1642.

Soubise, CHARLES DE ROHAN, PRINCE DE, field marshal, was born in Paris on July 15th, 1715, being the son of a mistress of Louis XIV. Though an incompetent soldier, he was entrusted with high command by Louis XV., and in 1757 was ignominiously defeated by Frederick the Great at Rossbach. In the next year, under the guidance of Marshal d'Estrées, he to some extent retrieved his reputation, and in 1762 was successful at Johannsburg. His later years were spent at Court, where he enjoyed the patronage of Madame de Pompadour and Madame Dubarry. He died at Paris on July 4th, 1787.

Soudan, or SUDAN (Arabic, "Blacks"). in its most comprehensive sense, is a somewhat vague geographical term used by Arabs to designate the habitat of the Negro tribes of

Africa, thus being the Black Zone of the continent, and adopted by European writers when writing generally about Central Africa. Roughly speaking, the district thus named lies between 5° and 18° N., and stretches from Cape Verd on the Atlantic to Massowah on the Red Sea, having the Sahara on the north and Guinea and the Congo territories on the south. The area considerably exceeds two millions of square miles, has a population, stated somewhat at a venture, of 57,000,000, and presents marked physical contrasts with the northern and southern portions of the continent, being elevated, well-watered, fertile, and habitable. More particularly, it is divided into the Western Soudan, comprising the Niger basin, the Central Soudan, which is drained into Lake Tsad, and the Eastern or Egyptian Soudan, which sends its waters into the Nile and its feeders. Ethnologically the vast majority of the population belongs to the Negro or Negroid race, Mandingoes, Hausas, Yorubas, Baghir-mis, and Battas being marked varieties. Ham-ites, such as the Tuaregs, Fulahs, Serrakolets, etc., exercise a predominant power in the west, but their blood is often mixed with that of the Negro. Semites or Arabs do not settle much west of Kanem, but are the practical masters of all the Eastern Soudan. The first-named division is occupied chiefly by Bambarrah, the Fulah States, the Hausa and Tuareg tribes, and the territory attached to Timbuktu, and practically constitutes FRENCH SOUDAN, which thus extends from the Niger to the Atlantic coast, with the exception of the British littoral possessions in South Nigeria, Ashanti, Sierra Leone, and Gambia, the independent Republic of Liberia, Portuguese Guinea, and German Togoland. In CENTRAL SOUDAN the principal states are the Niger provinces, Bornu, Kanem, Logon, Baghirmi, and Wadai, and these have been apportioned among Great Britain (which takes North and South Nigeria, Lagos and the bulk of Sokoto and Bornu), France (to which has been assigned Damerghu, Kanem, Wadai and Baghirmi), and Germany (which possesses South Bornu, Adamawa and Cameroon). The Egyptian, Equatorial, and Bahr-Ghazal provinces, embracing Darfur, Kordofan, and Khartum, and forming ANGLO-EGYPTIAN SOUDAN, were, after the Mahdi rebellion, which broke out in 1882, more or less reduced to anarchy, but they were restored to Egypt by the success of Lord Kitchener's campaign, culminating in the victory of Omdurman (1898). The Khalifa, the last hope of the insurgents, was slain in the battle of Gedid in 1899 and his followers were captured. This success ended the revolt. Anglo-Egyptian Soudan extends from the frontier of Egypt in the north to Uganda and Congo Free State in the south, and from the Red Sea, Abyssinia and Gallaland in the east to Wadai in the west, is administered by a Governor-General, nominated by Egypt subject to the approval of Great Britain, and comprises the provinces of Khartum, Blue Nile, Dongola, Berber, Kassala,

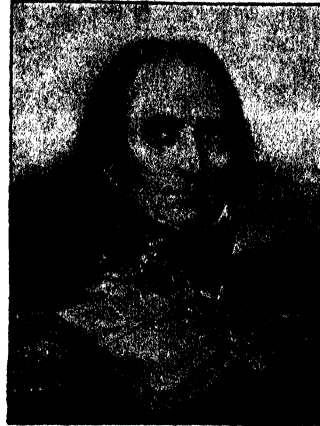
Sennar, Kordofan, White Nile, Bahr-el-Ghazal, Halfa, Suakin and Upper Nile, thus defined occupying an area approximately of 950,000 square miles and supporting a population of 2,000,000, which would appear to be a decided under-estimate. There are great stretches of fertile land in many parts of this vast region where durra, millet, sesame, pulse, cotton and wheat are cultivated. Some of the tribes own large herds of fine cattle. The forests produce trees of economic value, such as the gum acacia of Kordofan, the ebony, bamboo and the rubber of the Bahr-el-Ghazal. The mineral wealth includes gold (from Kordofan especially), copper (from Hofrah and elsewhere), and iron (from Dar Fur and other districts). The chief exports embrace ostrich feathers, ivory, cotton, minerals, hides and skins, cattle, gums, timber and medicinal plants. Khartum (14,023), the seat of government, contains the Governor's palace, the Government offices, the Gordon Memorial College, and the finest modern mosque in the whole Soudan, and is in railway and telegraphic communication with Cairo. Other large towns are Omdurman (39,916), the old Dervish capital, Halfa, Berber, Suakin, Kassala and El Obeid. The blacks are an industrious, decent, well-behaved people, upon whom the slave-traders have practised their hellish traffic for over 5,000 years. The rule of the Arab was an unmitigated curse, and if only because it put an end for ever to the horrible cruelty of the slave-merchant the reduction of the Soudan will be amply justified in the history of civilisation. Missionary labours are carried on with considerable success by the American Mission, which would seem to act with unusual sympathy for the sentiment and point of view of the natives. Recurring to the Soudan in the widest significance of the word the statistics of area and population may be summarised thus:—

| Territory. | Area in square miles | Population. |
|-------------------------------|----------------------|-------------|
| BRITISH (East, Central, West) | 1,500,000 | 42,000,000 |
| FRENCH (West and Central)... | 600,000 | 9,000,000 |
| GERMAN (West and Central)... | 200,000 | 6,000,000 |
| Total | 2,300,000 | 57,000,000 |

Soul, a word of greatly varying and perplexing signification. By some it is used to signify the principle of life, by others the thinking and self-conscious part of man, and by others a certain inner man, independent of body or mind, constituting the real man as independent of mind and body, and outlasting them both, though the different parts will be united hereafter. But this last is rather a religious belief than a philosophical tenet, and indeed the whole question of the soul as such enters more into the region of theology than that of philosophy. As denoting the principle of sentient life, the soul seems to be as much an attribute of other animals as of mankind, and some

have gone so far as to claim it even for plants. Possibly this idea gave ancient mythology its belief in the Hamadryads, besides other forms of Nature worship. Much profitless controversy has been entered upon by people who differed upon fundamentals and so misunderstood each other's arguments. Joseph Butler, Bishop of Durham (1692-1752), makes much use of the soul argument in his *Analogy*.

Soult, NICOLAS JEAN DE DIEU, DUKE OF DALMATIA, marshal of France, the son of a country notary, was born at St. Amans-la-Bastide, in the department of Tarn, on March 29th, 1769. He, too, was destined for the Law,



MARSHAL SOULT.

(From the portrait by Rouillard.)

but, in consequence of his father's death, enlisted at the age of sixteen, and, having won his captain's epaulettes in 1793, in the following year leaped to the rank of brigadier-general for his brilliant services under Lefebvre in Flanders. Five years were now spent in Germany, where the battle of Altenkirchen added to his fame, and he next joined Masséna in Switzerland, took a distinguished part in the battle of Zürich, and pursued Suvoroff into Italy. He was wounded and taken prisoner outside Genoa in 1800, but got an exchange after Marengo. As marshal he commanded the centre at Austerlitz (1805), and then won the battles of Jena (1806) and Eylau (1807), and captured the city of Königsberg. In 1808 he began his protracted struggle against the Duke of Wellington in the Peninsula, and in 1814 gave his services to the new dynasty, coming to England with the Allied Sovereigns. However, he went back to his old master for the Waterloo campaign, and then remained for four years in exile. Under Louis Philippe he became Minister of War, ambassador in London, and was loaded with honours. He declared himself a Republican in 1848, and died

at his castle of Soultberg, near his birthplace in the department of Tarn, on November 26th, 1851.

Sound. The sensation of sound is produced in the brain when the auditory nerve is affected in a particular way. Sound is transmitted through the air by means of waves; an original impulse given to certain gaseous molecules causes these to start outwards and, after hitting others, to rebound. These latter, in their turn, give up their motion to fresh ones, and so a series of to and fro movements is set up, the effect travelling outwards as a wave. As each particle starts forward it causes a condensation of air in front, and a rarefaction behind; while the wave travels onwards in the same direction as that in which the molecules are moving. The faster the particles move to and fro the more quickly does the wave travel onwards, and, as the rate of rebound of the particles depends on the elasticity of the air, it follows that the velocity of sound also varies with this property. [ACOUSTICS.] The loudness of a sound diminishes as we recede from its source, and in such a way that the intensity is inversely proportional to the square of the distance; this is true if the sound be free to travel in all directions, but if the sound be forced to limit its direction this law does not hold. This limitation of direction is obtained when a person speaks into a tube: the sound as heard by a person some distance away is almost as loud as it is near the speaker.

A continuous sound may appear to us as music or as noise. If the sound-waves travel sufficiently rapidly, and follow each other with perfect regularity, we obtain a musical note, but directly the regularity ceases the music descends to noise. It might seem that the method of production would determine whether a sound were musical or not, but this is not the case; regularity is the one essential. The wheel invented by Félix Savart (1791-1841), the French physician and scientist, is provided with a number of small cogs or teeth, regularly placed round its circumference. If the wheel be made to strike against a card as it rotates, a quick succession of taps is obtained, which gives a note when the speed of rotation is sufficiently high. In the siren air or steam is made to issue in quick, regular puffs, and so produce a note. In many other ways can musical notes be produced: by the vibrations of a stretched string, by the rapid oscillation of a clamped rod, or by the lightning strokes of an insect's wing. One of the commonest methods of getting a pure note is to throw a tuning-fork into vibration by drawing a bow across it. Although it is impossible to count the number of vibrations made by such a fork by merely watching it, yet the fork may be made to register its movements in a very simple way. A fine style is attached to one prong, and this is made just to touch a piece of smoked glass (Fig. 1). When the fork is sounding the smoked glass is quickly moved downwards with

constant velocity. A series of tiny waves then appears on the glass. By counting the number of waves in any length, and knowing the velocity of motion of the glass, the number of vibrations can be found. It will be noticed that, as time goes on, the sound, although remaining the same note, gets less and less intense. This effect is shown on the blackened glass by the decreasing amplitude of the waves. The vibrations of a tuning-fork may also be exhibited by means of Lissajou's figures. These vibrations set up a succession of rarefactions and condensations in the air which may be thus exhibited, and the length of a sound-wave is the distance between points of the greatest condensation or rarefaction, i.e., C_1-C_2 or R_1-R_2 (Fig. 2). The actual wave-length of any note in air is found by dividing the distance traversed by the sound per second by the number of vibrations per second of the tuning-fork. Taking the velocity of sound to be 1,120 feet a second at ordinary temperature, a



FIG. 1.

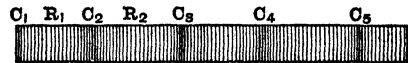


FIG. 2.

fork giving 320 vibrations per second will generate waves $3\frac{1}{2}$ feet long. Since the pitch of a note rises with the increase in number of vibrations, it follows that in the same medium a high note is produced by shorter waves than a low note. The wave-length of a note is twice as much as that of its octave higher, and the waves produced by a woman's voice are only about a quarter the length of those produced by a man's.

Temperature exerts its effects on the wave-length: the wave-length increases with rise of temperature when the rate of vibration is the same. The use of vibrating strings as a source of sound is exhibited in the violin and other musical instruments, but the vibration of the string itself has to be taken up by a sound-board to make it produce an audible sound. The laws of vibrating strings can be experimentally found by means of the monochord. It is then found that the rate of vibration varies—(1) inversely as the length of the string; (2) inversely as the thickness; (3) directly as the square root of the tension; (4) inversely as the square root of the density. If such a stretched string be touched at a point half-way along it and a bow be drawn across one segment the string vibrates in two halves. If held at a point one-third of its length from one end, and the shorter part be agitated, it will vibrate in three parts (Fig. 3). The same sort of thing happens if the string be touched at points $\frac{1}{4}$, etc., of its length along it, the string vibrating in 4, 5, etc., equal segments. These segments are separated from each other by points at which there is no motion, and

these points are called nodes. When the string is halved, it follows that the rate of vibration is doubled, and the pitch of the note is raised, and we have, in fact, the octave; when the string vibrates in three parts we have the

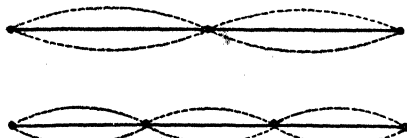


FIG. 3.

twelfth. Those notes which can be produced by dividing the string into any aliquot parts are known as the overtones or harmonics of the string. When it vibrates as a whole, the note is known as the fundamental; but when apparently vibrating as a whole, the smaller vibrations occur as well as the others, and the overtones are mingled with the fundamental; it is the presence of these overtones which gives quality to the sound produced. Some overtones are not a pleasant addition to the note; so in the piano, for instance, one of these discordant harmonics is avoided by making the hammer strike the wire at a point (about $\frac{1}{4}$ the length of the wire from its end) which would naturally be a node of that overtone, but which is now set in active motion.

The modes of division of a rod fixed at both ends, and made to vibrate transversely, are the same as those of a stretched string, but the rates of vibration are not the same. When the number of nodes is 0, 1, 2, 3, etc., the rates of vibration are proportional to the numbers $3^2, 5^2, 7^2, 9^2$, etc. A rod fixed at one end may also vibrate as a whole or in segments, and the rates of vibration of the overtones are thus related (Fig. 4). If the rate of vibration of the fundamental be considered as proportionate to 2^2 that of the first overtone is proportional to 5^2 ,

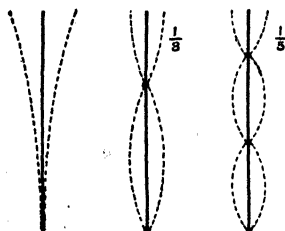


FIG. 4.

and the rates of the first, second, third, etc., overtones are proportional to the numbers $3^2, 5^2, 7^2$, etc. With rods of different lengths the rates of vibration vary inversely as the square of the length. This is the basis on which the musical box is

constructed. A rod free at both ends will vibrate in its simplest manner when possessing two nodes (Fig. 5). With 2, 3, 4, 5, etc., nodes, the rates of vibration are nearly proportional to $3^2, 5^2, 7^2, 9^2$, etc. This system is used in the *claquebois*, but only the simplest method of vibration, viz., with two nodes, is employed. The vibrations of a tuning-fork are comparable with those of a rod free at both ends (Fig. 6). The fundamental

has 2 nodes, the first overtone has 4; there is no division of a tuning-fork by three nodes. Ernst Florens Friedrich Chladni, the Saxon physician (1756-1827), investigated the vibrations of plates and obtained beautiful figures—known as Chladni's figures—by strewing sand on the vibrating body, the sand distributing itself on

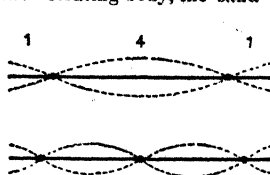


FIG. 5.

the nodal lines. The overtones of plates and also those of cells are not simply related to the fundamental, so these bodies are not greatly employed in music.

The vibration of columns of air is

made use of in organ pipes. Pipes may be of two kinds, open at both ends or closed at one. In the tube closed at one end that end is necessarily a node, while the open tube possesses a node at the centre. The note from an open pipe is therefore the octave of a closed pipe whose length is the same. In an open pipe the wave-length is twice the length of the pipe, in a closed one four times. In an open pipe the rates of vibration of the fundamental and overtones are proportional to the numbers 1, 2, 3, 4, etc., while in the stopped pipe they are proportional to 1, 3, 5, 7, etc. Reeds are often connected to columns of air and set up the vibrations [REED], and the vocal cords of the human throat act like the reed of an instrument. Sounds often occur which are made up of a number of component notes. These can be sifted by means of resonators, or by sensitive flames.

Simple sounds may be arranged in scales, the notes of the scale being related in a simple way; the rates of vibration are proportional to 24, 27, 30, 32, 36, 40, 45, 48, the number 24 representing the fundamental, and 48 the octave. Between any consecutive two of these

numbers there are only 3 ratios or intervals, these are $\frac{4}{3}$ a major tone, $\frac{3}{2}$ a minor tone, and $\frac{1}{2}$ a limma. To use this in practice would be inconvenient, so the octave is divided into 12 parts, the interval between two consecutive notes being the twelfth root of 2; this is known as a scale of equal temperament.

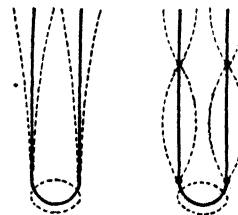


FIG. 6.

Discord is produced when many notes are struck together, and if two consecutive low notes be sounded at once, that sort of discord is obtained which gives rise to audible beats. Sound is propagated by waves in the same way as light. The laws of reflection and refraction are the same in both cases. Reflection is illustrated in the case of echoes, and refraction is exhibited when sound is concentrated by means of a lens containing a gas (e.g., carbonic dioxide) denser than air.

Sounding, the process of ascertaining the depth of the sea, lake, or river, for the purpose either of navigation or of scientific investigation. Galvanised wire has replaced the rope of the older-fashioned apparatus, and at the end is a hollow tube which, by means of specially-devised appliances, brings up specimens of the bottom and even of the water. In such deep-sea exploration as was conducted by the *Challenger*, for example, sounding is constantly resorted to and indeed without it the expedition would be futile so far as science was concerned. With the latest apparatus soundings of 1,000 fathoms can be taken in 25 minutes and of 3,000 fathoms in 75 minutes.

South, ROBERT, divine, was born in Hackney, London, on September 4th, 1634, and was educated at Westminster School and Christ Church, Oxford. He took holy orders in 1658, and two years later became public orator of Oxford University, and was rapidly promoted in the Church. He was successively chaplain to the Earl of Clarendon (1661), Prebendary of Westminster (1663), Canon of Christ Church (1670), and rector of Islip in Oxfordshire (1678). In 1713 the bishopric of Rochester and deanery of Westminster were offered to him, but the condition of his health was then precarious. "Such a chair," he said, "would be too uneasy for an infirm old man to sit in." He died at Westminster on July 8th, 1716, and was buried in the Abbey near the grave of Busby. He was a strong opponent of the Dissenters, and poured all the wit and eloquence he possessed on them and their doctrines. He took no part in the furtherance of the Revolution, though he did not strenuously object to it. He was charged with heterodoxy for attempting to explain an inscrutable mystery in his famous controversy with Sherlock on the Trinity. His chief writings are his *Sermons*, which abound with wit and good sense, and are often very eloquent and refined. They form twelve volumes, and entitle South to a very conspicuous place in the roll of notable English preachers. He had a somewhat sarcastic temper, which he gave as his reason for refusing a bishopric.

South Africa. In the latter half of the 19th century the map of South Africa was re-arranged on an extensive scale. The great bulk of the territory is now British, although part of the south-western face is German and part of the south-eastern Portuguese. The statistics of the different political tracts may be most conveniently exhibited in the tabular form which will be found in the next column. To these add for German South-West Africa (Namaland and Damaraland) an area of 392,450 square miles and a population of 200,000, and for Portuguese East Africa (Mozambique, Zambesia and Lourenço Marques) an area of 293,400 square miles and a population of 3,120,000, and we obtain a grand total for South Africa of an area of 1,918,297 square miles and a population of 10,285,077. In the

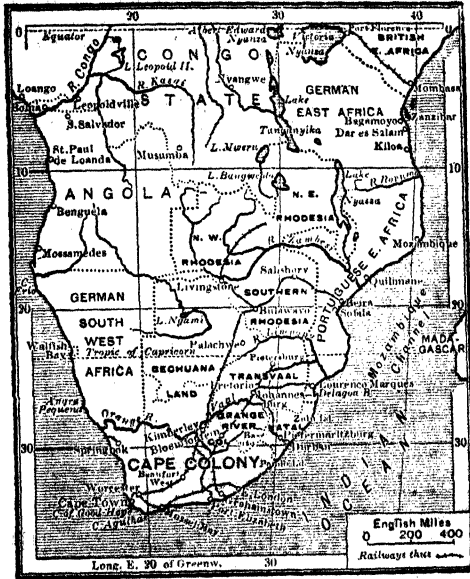
south the surface is a tableland of an average height of from 3,000 to 4,000 feet above the sea, broken by mountains, isolated like Table Mountain (3,550 feet), or in ranges such as the Roggeveld, Nieuwveld, Zwarte Berg, Lange Berg, Sneeuwberg, Stormberg and Drakensberg, the loftiest peak of which reaches an altitude of 10,358 feet. The hill country is diversified by terrace-like plateaus, the famed Karroos

BRITISH SOUTH AFRICA.

| DIVISIONS. | AREA IN SQUARE MILES. | POP. (1904). |
|---------------------------------|-----------------------|--------------|
| BASUTOLAND | 10,298 | 348,626 |
| BECHUANALAND PROTECTORATE | 386,200 | 120,770 |
| CAPT. COLONY | 206,800 | 1,489,691 |
| { East Griqualand | 7,594 | 222,085 |
| { Tseebuland | 4,117 | 281,472 |
| { Transkei | 2,552 | 177,780 |
| { Walvisch Bay | 430 | 997 |
| { Pondoland | 3,918 | 202,757 |
| { South Bechuanaland | 51,524 | 84,472 |
| NATAL | 85,371 | 1,108,764 |
| ORANGE RIVER COLONY | 50,892 | 387,315 |
| RHODESIA | | |
| { Southern Rhodesia | 144,000 | 609,157 |
| { N. E. " | 106,000 | 346,241 |
| { N. W. " | 152,000 | 400,000 |
| TRANSVAAL COLONY | 111,196 | 1,284,404 |
| TOTAL | 1,802,447 | 6,965,077 |

where "one may live with half a lung" and which in the wet season are beautiful with flowers and grasses, and in the dry are little better than barren steppes. The great rivers are the Orange and the Olifants flowing to the Atlantic, the Buffalo, Tugela, Limpopo and the Zambesi to the Indian Ocean and the Vaal, a righthand affluent of the Orange. The northern interior mainly consists of sandy desert, part of which is the Kalahari, which Parker Gillmore described as the Great Thirst Land. The Victoria Falls on the Zambesi constitute one of the natural marvels of the world, while the mysterious remains at Zimbabwe in Matabeleland are supposed to indicate the presence of Semitic explorers or gold-hunters, a thousand years or more before the Christian era. The climate in the uplands is invigorating and healthy, but parts of the eastern seaboard are malarious. The prevailing diseases of enteric, ague, dysentery and diarrhoea are due to bad drinking water, or hardships long endured, or the frequenting of swampy tracts. The flora comprises the acacia, euphorbia, mimosa, many kinds of lovely flowers and heaths, and the diversified vegetation which makes up the "bush." The fauna, once abundant, has either perished at the hands of the hunter or retreated northwards to escape extermination, but the springbok and other antelopes, baboon, leopard, buffalo, puff adder, secretary bird, ostrich and tsetse are common in certain localities, and occasionally the crocodile, hippopotamus and elephant may yet be met with. The mineral wealth is remarkable and includes

especially gold and diamonds; iron, copper, tin, silver and coal also occur in different districts. But for the want of water agriculture and stock-raising would form the leading industry and, as systems of irrigation are introduced, farming will advance. The soil yields various cereals (wheat, oats, barley, rye and maize, or "mealies," to give it the South African name)



SKETCH-MAP OF SOUTH AFRICA.

and fruit of many sorts (grape, orange, fig, peach, apricot, apple, pear, plum, lemon) grows profusely and possesses a choice flavour. Tobacco might also be cultivated with decided advantage. The grape reaches such a high degree of perfection that, with up-to-date methods of production, the Cape might become one of the foremost wine countries of the world. Unfortunately this industry has been hindered by the innate conservatism of the Dutch farmer. What was good enough for his father, he argues, is good enough for him—and meanwhile the colony at large pays the penalty. But salvation may be looked for from the younger generation of Dutchmen, who are in touch with the modern spirit and many of whom are educated in Europe. The plains and uplands sustain vast flocks of sheep and goats, and great herds of cattle, horses, mules and pigs, while ostrich-farming is a characteristic industry, the feathers constituting with minerals, wool, mohair and fruit the leading articles of export. The supreme functionary of British South Africa is the High Commissioner, who is charged with the promotion and safeguarding of common interests and officiates as Governor of the Transvaal and Orange River

Colony, besides being Commandant of the armed forces and discharging other administrative duties. The Cape Colony, Natal, Transvaal and Orange River are self-governing colonies, while other territories are under the control of Administrators or Commissioners.

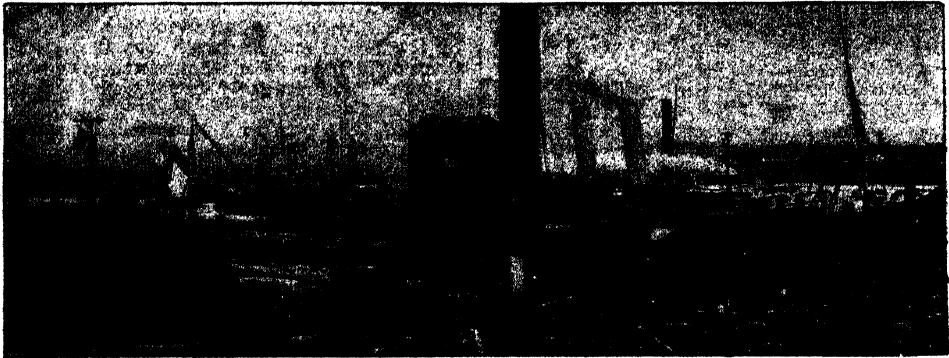
South America. [AMERICA.]

Southampton, a seaport, borough and county of itself, Hampshire, England, situated on a peninsula at the head of Southampton Water, washed on the east by the Itchen and on the west by the Test, 13 miles S. by W. of Winchester. Bitterne, a north-eastern suburb, was the site of the Roman station Clausentum. Towards the close of the 5th century the West Saxons landed in the vicinity under Cerdic and Cynric and the name Hantun-scire appears in the *Saxon Chronicle*, the forms Hamtun and Hantune occurring somewhat later (the latter in Domesday Book). It was repeatedly ravaged by the Danes and its beach was the scene of Canute's rebuke to his flatterers. The prefix "South" was probably introduced to distinguish the town from Northampton, while as Hamtun, the port of Winchester, it gave its name to the shire. It was frequently visited by the earlier English monarchs and from its position was occasionally the point of departure of hostile expeditions against France and Spain (such as that of Henry V. in 1415, which ended in the battle of Agincourt) and was also often attacked by foreign foes (as in 1338 when it successfully withstood the assault delivered by the French and Genoese fleets). Remains of its walls still exist and North Gate (or Bar Gate), West Gate and South Gate are in fair preservation. On the landward front of Bar Gate once stood figures of Sir Bevis of Southampton and the giant Ascapart, whom he conquered. Another interesting relic of the past consists in the Town Bowling-green near the harbour. If, as is said traditionally, it was laid down in the reign of Edward I., it is much the oldest green in the world and the Club playing on it has managed fortunately to preserve a long unbroken user so that they cannot be dispossessed except by special statute. The town holds charters from Henry I., Henry II., Richard I., John, Henry VI. and Charles I. Amongst distinguished natives were Dr. Isaac Watts, Sir John Everett Millais and Charles Dibdin. The last of the castle was taken down in 1863, its site having grown too valuable. Many picturesque ancient bits are extant within the gates, the modern increase having taken place to the north of High Street, the newer district in this quarter being known on that account as Above Bar. What has made the town is its magnificent harbour and ample dock accommodation, although from the Middle Ages, when it had the bulk of the wine trade, it has always carried on an important traffic with the Continent and the Channel Islands. Owing to its advantage of double tides, a second high tide occurring two hours after the first, as well as to its natural position,

the largest vessels can come and go at all tides and there is anchorage for the world's fleets. The docks, first opened in 1842, have been added to at intervals since and in 1892 were acquired by the London and South-Western Railway, a step of far-reaching importance, which marked the beginning of an enormous stride forwards. Liners now regularly sail hence to the United States, Australia and the Cape and the diversion of the express passenger service of the White Star line from Liverpool in 1907 was an unmistakable sign of the comparative value, in a commercial sense, of the facilities offered by Southampton. Railways extend to all the quays and the vast warehouses and passangers for the ends of the earth are conveyed directly from Waterloo, the London and South-Western terminus in Lon-

There are theatres, assembly-rooms and music-halls, besides the county cricket ground and a modern bowling-green, and the headquarters of the Royal Southampton Yacht Club and the Royal Southern Yacht Club. There are excellent public spaces in different localities and to the north Southampton Common affords a fine recreation ground and contains an avenue of noble elms. One of the most interesting monuments is the memorial (unveiled in 1885) to General Gordon, who frequently made his residence in the town when he was in England. Pop. (1901), 104,824.

Southampton, HENRY WRIOTHESLEY, 3RD EARL OF, patron of William Shakespeare, was born at Cowdray House, Midhurst, Sussex, on October 6th, 1573, being thus nearly ten years



SOUTHAMPTON DOCKS.

[Photo: S. Cribb, Southsea.]

don, by special trains alongside of their steamers. The manifold traffic incidental to a port controlling interests of such magnitude furnishes the leading industry, but shipbuilding and engineering are also extensively carried on. Amongst the churches are St. Michael's, containing some Norman work, Holyrood in the Decorated style, and St. Mary's erected to the memory of Bishop Wilberforce (who died in 1873). In the French chapel of St. Julien, attached to the Hospital of God's House, were buried the Earl of Cambridge, Lord Scrope and Sir Thomas Grey, who were executed outside of Bar Gate by Henry V. for treason (1415). Other prominent buildings are the Watts Memorial Hall, the Municipal offices, Guildhall, Public Free Library, the Grammar School (founded in 1553), Alderman Taunton's Trade School (founded in 1760), Hartley Institution, one of the most important establishments for technical education in the kingdom (opened in 1862), the Corn Exchange, the Custom-house, the Royal South Hants Infirmary, the Female Orphan Asylum, the Dispensary, St. Mary's Cottage Hospital and the Ordnance Survey Office, where all the maps and plans of the survey of the United Kingdom are produced.

the dramatist's junior. He was educated at St. John's College, Cambridge, where he graduated M.A. in 1589. He had already entered his name as a student at Gray's Inn, and, settling in London, soon became a welcome figure at Court. He distinguished himself, however, by his encouragement of letters. John Florio associated his name with his Italian-English Dictionary, *A Worlde of Wordes* (1598). Five years earlier Shakespeare dedicated to him *Venus and Adonis*, and in 1594 his *Lucrece*. There seems reason to believe, too, that the patron had presented the poet with £1,000 to enable him to effect the purchase of some property on which he had set his heart, so that if Shakespeare addressed most of his Sonnets to his munificent friend, as is very probable, he had ample cause even for florid adulation. After sharing in the Earl of Essex's expeditions to Cadiz and the Azores, he went in 1598 to Paris in the suite of Sir Robert Cecil, but in the same year incurred Queen Elizabeth's enmity by a clandestine marriage with Elizabeth Vernon. He was involved in the Earl of Essex's fall (1601), but in his case capital punishment was commuted to imprisonment for life. The accession of James I., how-

ever, set him free and he obtained a high place at Court under the new monarch. He was made K.G. in 1603 and also Captain of the Isle of Wight, while his earldom (forfeit for his complicity in Essex's treason) was fully restored. Through a quarrel in the Presence Chamber (1604), precipitated by his hot temper, his influence at Court suffered partial eclipse. Afterwards he took an active part in colonising Virginia, and, though brought up as a Catholic, interfered on behalf of the German Protestants (1614). He accompanied the King to Scotland in 1617 and was sworn in as a privy councillor in 1619. Thenceforward he interested himself in home politics, taking it upon himself to counteract the malign influence of the favourite, the Duke of Buckingham, and also supporting the attempt to degrade Bacon from the peerage. In 1624 he went as a volunteer to fight in the Netherlands against Spain, but was attacked by fever and died at Bergen-op-Zoom on November 10th in that year. His passion for literature remained to the last.

South Australia, a state of the Commonwealth of Australia, roughly occupying the middle section of the continent, and, with the later addition of the Northern Territory or Alexandra Land, extending from the Southern Ocean to the Arafura Sea off the northern coast, a distance of nearly 2,000 miles, and having an area of 903,690 square miles. It is divided from West Australia on the W. by the meridian of 129° E., and, on the E., from Victoria and New South Wales by that of 141°, and from Queensland by that of 138°. Before the inclusion of the Northern Territory its northern boundary was the parallel of 26° S. The southern coast line of 1,500 miles is deeply indented by Spencer and St. Vincent Gulfs (which are separated by Yorke Peninsula), and marked also by the conspicuous promontory of Eyre Peninsula and the massive sweep of the Great Australian Bight, while the northern coast possesses many harbours. Except the Murray, there are no navigable rivers, but the southern part is well watered by small streams, and has several fine lakes, e.g., Torrens, Gairdner, Frome, Island, Eyre, Gregory, and Amadeus. The surface is level or undulating, the Gawler Range (2,000 feet), Flinders Range (3,000 feet), and Mt. Bryant being the greatest elevations. In the north, Melville and Bathurst Islands and Groote Eylandt, and, in the south, Kangaroo Island belong to the state. Much of the interior, owing to the extreme drought, is almost barren desert, but in the south, where streams are more numerous and most of the lakes are found, the soil is generally fertile, and yields cereals, roots, excellent fruits, grapes, olives, and even rice, but irrigation even in these regions is often necessary. The climate is peculiarly healthy, and invalids are sometimes sent from England for the benefit of the warm dry air. Coal is scarce, but copper, silver-lead, gold, tin, bismuth, man-

ganese, antimony, asbestos, precious stones, and iron with other metals have been worked. Valuable marbles, slates, and building stones are also quarried. Agriculture is the outstanding industry. In the state proper there are millions of sheep and great droves of cattle, horses, and pigs. The export of wool is of paramount importance. There are fisheries of trepang, or bêche-de-mer, and pearls in the north, but the former whale and seal fisheries



SKETCH-MAP OF SOUTH AUSTRALIA.

in the south are extinct. Much effort has been made to bring the wines and the fresh and preserved fruits of the state into the European market. The animal life includes the kangaroo, opossum, dasyure, echidna, ornithorhynchus, wombat, ant-eater, dingo, many parrots, the mound-building birds, honey-suckers, emu, and several poisonous snakes. The flora comprises the eucalyptus, acacia, pine, Banksia, Adansonias, varieties of cedar and palm, rattans, and some spices. The north coast was known to Portuguese and Spanish navigators about the middle of the 16th century, but Flinders's discoveries of the southern gulfs and Kangaroo Island in 1802 first really attracted attention to this part of the continent, though it was not until 1836 that effective settlements were made and the colony was proclaimed. In 1901 it joined the federation of states composing the Commonwealth. The overland telegraph is conveyed from Adelaide, the capital, to Port Darwin,

in the north. The government of the state consists of a Governor nominated by the Crown, an executive council, a legislative council elected on a property franchise, and the House of Assembly elected by manhood suffrage. Pop. (1901), 362,604.

South Carolina, one of the original thirteen states of the American Union, occupies a triangular area of 30,570 square miles, being separated from Georgia on the W. by the Savannah and Tugaloo rivers, having North Carolina as its northern boundary, and extending along the Atlantic from S.W. to N.E. for some 200 miles. It is popularly called the Palmetto State, from the prevalence of the Cabbage Palm (*Sabal Palmetto*), and originally formed part of the early Spanish acquisition of Florida, being also known as New France, from the fact that Charles IX. permitted Admiral Coligny, in 1562, to plant a colony of Protestants there. The Spaniards took care to exterminate all such rival settlements, but in the meantime the French colonists had named their stronghold Carolina, after their King. A century later British plantation was effected permanently, and the colonists named Charleston after their King. In the War of Independence the colony acted energetically against the mother country, and in 1860 South Carolina enjoyed the bad eminence of leading the Secession which plunged the Union into the lamentable strife of the Civil War. She was readmitted into the Union on June 25th, 1865. The state has suffered, at times most seriously, from earthquake and hurricane. Along the coast the land is low and swampy, rising gradually to an elevation of 200 to 300 feet in the centre, and sloping more steeply northwards to the spurs of the Blue Ridge, where elevations of over 3,000 feet are found. The coast districts produce famous crops of rice and sea-island cotton. Cereals, potatoes, indigo, tobacco, fruits of all kinds, and grapes are largely grown on the higher levels, whilst the hilly region yields valuable timber. It is noted for its wealth of exquisite flowers, including the camellia, jasmine, honeysuckle, sweet-brier, azalea, hyacinth, violet, dahlia, tulip, verbena, and heliotrope. The fauna comprises deer, wild turkey, raccoon, opossum, and many kinds of birds, whilst the fisheries yield sturgeon, turtle, and oysters, in addition to the commoner fishes. Water is abundantly supplied by many small rivers, the Pee Dee, Edisto, and Santee, with its tributaries the Wateree, the Congaree, and the Catawba, being the longest. The climate is mild and healthy except in the swamps, where malaria is prevalent; but many feel it, in the words of the old nigger song, to be "a sultry clime." Numerous bays, creeks, and islets afford facilities for navigation. Cotton-spinning and the making of turpentine and artificial manures are the chief industries. Gold, copper, iron, manganese, and other minerals are profitably worked, and China clay is a source of considerable wealth. Columbia, the capital, is in the centre of the state; Charleston, with the

largest population, stands at the head of a gulf on the banks of the Ashley river. Other towns of importance are Newberry, Georgetown, Orangeburg, Florence, Camden, and Sumter. Pop. (1900), 1,340,316, of whom more than one-half were negroes.

Southcott, JOANNA, prophetess, was born at Gittisham, in Devonshire, in 1750, and became a Methodist. She suffered from religious mania, and in her fervour declared she was the woman referred to in Revelation xii., and was to bring forth a new Saviour, the date of her delivery being fixed for October 19th, 1814. Great preparations were made for the event by her numerous followers, but all to no purpose. Her death in London on December 27th, 1814, was due to dropsy. She was believed in, however, for years after her death by some of her sectaries. She wrote several lucubrations, and issued seals which were passports to heaven and indulged rather largely in prophecy.

South Dakota, a state of the American Union, bounded on the N. by North Dakota, on the E. by Minnesota and Iowa, on the S. by Nebraska, and on the W. by Wyoming and Montana. It occupies an area of 76,850 square miles. The surface rises gradually from east to west, culminating in the Black Hills, of which Harney Peak, the highest point, has an altitude of 7,216 feet. To the south-east of these mountains occurs the region of the Bad Lands, or Mauvaises Terres, where the surface assumes the most extraordinary forms, though the name has reference to the difficulties it offers to travel and not to the poverty of vegetation, for, in fact, much of the soil in the district forms excellent pasturage. The state is divided into two nearly equal portions by the Missouri, which, along with its tributaries—on the right, the White, Big Cheyenne, Moreau, and Grand; on the left, the James or Dakota, is the chief river. The mineral wealth includes gold, silver, copper, lead, tin, lignite, coal, natural gas and petroleum, mica, lime, jasper granite, and building stone. Wheat, maize, flax, oats, barley, hay, rye, potatoes, and sorghum are the staple crops, and several kinds of vegetables and fruits are cultivated. Cattle and pigs are the principal live-stock. Pierre (2,306) is the capital, and amongst other towns are Sioux Falls (10,266), Lead (6,210), and Yankton (4,125). South Dakota formed part of the Louisiana purchase of 1803, was organised as a Territory in 1861, and was admitted to the Union in 1889. Though its population in 1870 only numbered 12,887, in ten years it had grown to 135,180, in consequence of the gold finds in the Black Hills and the development of farming. Pop. (1900), 401,570.

Southend-on-Sea, a watering-place of Essex, England, on the northern shore of the estuary of the Thames, 36 miles E. of London. Its vogue as a health resort is considered to date from the visit in 1804 of Queen Caroline and Princess Charlotte. Owing to its comparative

proximity to the metropolis it has always been the favourite holiday haunt of Cockneys. West Cliff, as the west end is called, is entirely modern, and its air, which has been pronounced by Dr. Robert Moir to be only less invigorating than that of Margate, has attracted a large residential population, the bulk of whom attend business in London daily. The front has been tastefully laid out in terraces, backed by ornamental shrubbery, and a drive extends westwards as far as the picturesque old town of Leigh-on-Sea, near which is the exceptionally fine public park of the borough. The bathing is good, though somewhat interfered with by the distance to which the tide retreats. The pier is $1\frac{1}{2}$ mile long—the length being inevitable owing to the necessity of providing permanent deep water for the *Royal Sovereign*, *Koh-i-Noor*, and other well-known excursion steamers—but an electric tramway runs from end to end. Four miles to the north is Rochford Hall, where Anne Boleyn was born. Pop. (1901), 28,857.

Southern Cross is a constellation in the southern celestial hemisphere, its declination being about 60° S., and its right ascension 180° . It consists of five principal stars arranged as a somewhat irregular cross, and numerous smaller stars. The shape of the cross is gradually, but very slowly, changing, owing to the proper motion of the stars themselves. The cross is first seen by travellers voyaging southwards in the Atlantic when they reach the twentieth parallel, and it is as noticeable a constellation in the southern hemisphere as the Great Bear is in the northern. Its form is used as a decoration on the Brazilian stamps instead of the usual head.

Southerne, THOMAS, playwright, was born at Oxmantown, near Dublin, in 1660, and educated at Trinity College, Dublin. He came to London afterwards and entered the Middle Temple in 1678, and, four years later, produced his first play, *The Loyal Brother*, notable, if for nothing else, for its veiled compliment to the Duke of York. Later the author joined the army, but his prospects in this direction were ruined by the Revolution. Accordingly he settled in London and wrote for the stage a number of plays, which yielded him more than a living wage, but of which only two were conspicuous successes, namely, *The Fatal Marriage*, or *The Innocent Adultery* (1694), and *Oroonoko*, or *the Royal Slave*. Southerne died in London on May 22nd, 1746.

Southey, ROBERT, Poet Laureate, the son of a draper, was born at Bristol, England, on August 12th, 1774. He was chiefly educated at Westminster School, for his subsequent admission to Balliol College, Oxford, did not have much effect on his culture. He travelled abroad for a year or two (marrying secretly, on November 14th, 1795, before he started, Edith Fricker, whose sister, Sara, had married S. T. Coleridge in the previous month), and lived in Ireland for a few months, holding an official appoint-

ment there. In 1803 he settled at Keswick, in Cumberland, near Coleridge and Wordsworth. He was at this time very well known as a poet, his *Wat Tyler* having appeared in 1794, and other works, influenced by the events of the French Revolution, such as *Joan of Arc* (1796), following rapidly. Besides a couple of collections of smaller poems, he published *Thalaba the Destroyer* in 1801, *Madoc* in 1805, *The Curse of Kehama* in 1810, and *Minor Poems* in 1815. Many of these were adversely and not unjustly criticised, and at the present day Southey is considered a better prose-writer than a poet, his *Life of Lord Nelson* (1813) being one of the finest biographies in the language, and the story of "The Three Bears" in *The Doctor* (1834-47) being inimitable in literature for the young. In 1813 he was made Poet Laureate, in succession to Henry James Pye (upon whom, at all events, he was a marked improvement), and in 1837 was offered, and declined, a baronetcy. He was a most voluminous writer, and a few of his lyrics are still admired. In 1839 he married his second wife, Caroline Bowles, a poetess of some merit. He died on March 21st, 1843, and was buried in Crosthwaite churchyard.

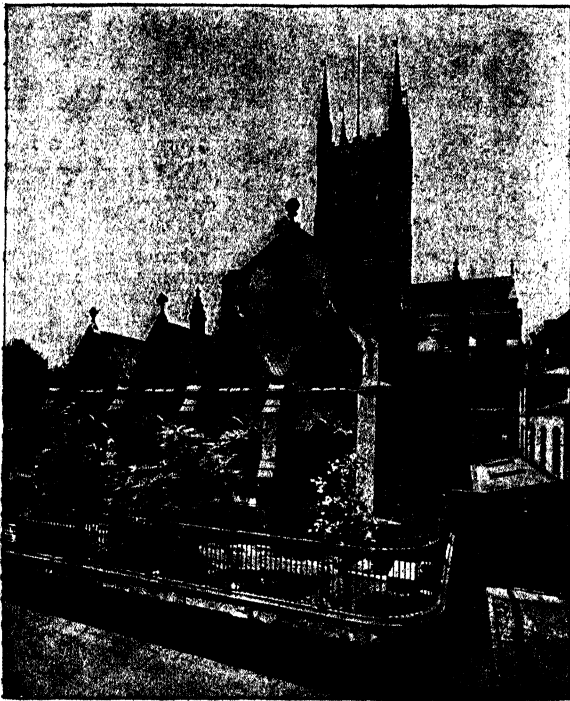
South Island, formerly known as MIDDLE ISLAND, New Zealand, occupying an area of 58,525 square miles. Pop. (1901), 381,661. [NEW ZEALAND.]

South Pole. [ANTARCTIC SEA; POLAR EXPLORATION.]

Southport, a watering-place of Lancashire, England, situated between the estuaries of the Mersey and the Ribble, 18 miles N. of Liverpool. Dating from 1792, it is almost exclusively a residential quarter, the streets being spacious and well-kept and the dwellings mostly of a superior order. The beach consists of a long stretch of firm sands, in the middle of which is a pier a mile long, backed by a promenade and marine drive $2\frac{1}{2}$ miles in length. The attractions are numerous. The Winter Gardens comprise a commodious conservatory, aquarium, and theatre. Hesketh Park, opened in 1868, contains a lake well stocked with waterfowl and a meteorological observatory. Other fine open spaces are the Botanical Gardens, Kew Gardens, the South Marine Park, and the Public Recreation Grounds. The more prominent buildings are the town hall in the Classic style, the Atkinson Free Library and Fine Art Gallery, Cambridge Hall, largely used for concerts, the Market Hall, the Infirmary, Convalescent Home, Hydropathic Hospital, Sanatorium for Children, Trinity Hall, a college for the education of the daughters of Wesleyan ministers, and the Victoria Schools of Science and Art. The Victoria Baths, opened in 1871, the Glaciarium, and the opera-house also provide additional recreation. Pop. (1901), 48,083.

Southsea, a watering-place of Hampshire, England, a south-eastern suburb of Portsmouth, of which borough it forms a part. Though the castle at the southern extremity of Portsea

island was erected in the reign of Henry VIII., the town, as a health and pleasure resort, dates only from the middle of the 19th century, since which period it has rapidly grown in popular esteem, partly owing to its salubrity—being quite level, it gets the full benefit of every breeze—and partly in consequence of its liveliness. Between the town and the beach is Southsea Common, a drilling-ground of the garrison. At the west end of the Common are the Clarence Esplanade Pier, Assembly Rooms, and Jubilee Gardens, and between the castle and Lumps Fort is the South Parade Pier.



SOUTHWARK CATHEDRAL.
(Photo: Pictorial Agency.)

South Sea Bubble is the name given to one of the most extraordinary financial transactions, in its issue a gigantic swindle, in the history of the United Kingdom. In 1710 a South Sea Company was formed, honestly promoted by Robert Harley, Earl of Oxford (1661-1724), to take up the national debt, then amounting to £10,000,000, for which it was to receive 6 per cent. interest, in addition to the monopoly of trade with South America. The Peace of Utrecht (1713) and the resulting conditions imposed by Spain on the commerce, rendered the monopoly worthless. But in 1720 England went mad on the point, and everyone possessed of money was eager to obtain the South Sea stock at any pre-

mium. The Company now obtained leave from Parliament to take up £300,000 more, and the Bank of England entered into the competition with counter-proposals that were not entertained. The South Sea Company, however, made more astonishing proposals, and the public enthusiasm rose still higher, the £100 shares touching £1,000 at the crisis of the mania; but their success, which partly arose from the fact of paying interest out of capital, raised many imitators, whom the Company tried to suppress by arguments people soon recognised as applicable to the Company also. The inevitable crash came and calamity was widespread. Sir Robert Walpole was called in to alleviate the distress, and inquiry showed that large sums had been spent to bribe in high places. He began by confiscating the estates of the directors, and eventually many of the victims received a dividend of 33½ per cent.

South Shields. [SHIELDS.]

Southwark, a district of London on the southern bank of the Thames between Tower Bridge and Blackfriars Bridge, communicating with the opposite bank by these bridges and Southwark Bridge. Apparently there is no mention of it under this name until the 11th century, though there can be little doubt that the Romans had a station here which, after their retreat, the natives maintained as a stronghold which in time the Londoners described as the South Work, or Wark. It has been popularly known as the Borough since 1296, when it first returned members to Parliament. It formed a separate community until 1327, when Edward III. granted it to the City of London, of which it has, since 1551, despite the *fluvius dissociabilis*, constituted an integral portion under the designation of the ward of Bridge Without, although it is not represented on the Common Council, and the sinecure position of alderman of the ward is held by the senior alderman of the City. The whole district teems with interesting associations. On pikes at the south gate of London Bridge—the Bridge Foot, as they termed it—were exhibited the heads of many illustrious victims of tyranny and bigotry, among those thus dishonoured being Sir William Wallace and Sir Thomas More. The highways to Kent and Surrey all originating here, processions of every degree of magnificence have passed through it. The imposing Gothic church of St. Saviour's, originally the church of the Priory of St. Mary Overy, was built in the 14th century, and comprises a nave and aisles, transepts, a choir and aisles, and, at the eastern end, a Lady

Chapel, while at the intersection of the nave, transepts, and choir there rises a tower of singularly stately proportions. Having the grandeur of a cathedral, the structure lent itself readily to the status of a cathedral when the bishopric of Southwark was created in 1891. Here Cardinal Beaufort was consecrated to the see of Winchester in 1404, James I. of Scotland was married in 1424, and "Moral" John Gower, the poet (1408), John Fletcher, the dramatist (1625), and Philip Massinger, another dramatist (1639), were buried. To the north-west of the church stood Winchester House, built in the 12th century as a palace for the bishops of Winchester, while to the south of it stood, till its removal to Sumner Street in 1838, St. Saviour's Grammar School, founded by Queen Elizabeth in 1562. Bankside, as the rivershore westwards of London Bridge was and still is called, came to be the favourite locality for theatres and out-of-door places of entertainment. Amongst these theatres were the famous Globe, opened in 1594 as a summer theatre for the company that played at Blackfriars during the winter, the Rose, for which Ben Jonson wrote, the Hope and the Swan. Shakespeare, as an actor at the Globe, lodged in Bankside and perhaps 150 years later Oliver Goldsmith practised as a doctor for a short time, with wonted ill luck. On the site of the Globe there afterwards rose Thrale's Brewery, at the sale of which, in 1781, Dr. Johnson was present as one of the executors. Being asked what the property was worth, he made the celebrated reply, "Sir, we are not here to sell a parcel of boilers and vats, but the potentiality of growing rich beyond the dreams of avarice." The firm later styled Barclay and Perkins acquired the property, and it was on their premises, in 1850, that the workmen hustled Marshal Haynau, the "Austrian butcher," who flogged women, and seemed like drowning him in a vat had he not fled in time. Paris Garden, or the Bear Garden, constructed in the 16th century, was notorious for its baiting of bears and bulls, Edward Alleyn (1566-1626), the actor and founder of Dulwich College, being once keeper or master, said to have been a lucrative post. In the vicinity were the Pike Gardens, where pike were bred for the Royal table, Asparagus Garden, and Pimlico Garden, the latter a resort where the fashionable world were wont to promenade, the forerunner of Ranelagh, Vauxhall, and Cremorne. Southwark inns were noted. Among them were the "Tabard," immortalised by Geoffrey Chaucer as the rendezvous of the Canterbury pilgrims, a tavern which refused to conceal its identity behind the later name of "Talbot"; the "Falcon," Shakespeare's house of call; the "Boar's Head," the property of Sir John Falstolf, and the "White Hart," the headquarters of Jack Cade and ever memorable in connection with the *début* of Sam Weller. Two of the greatest of London's hospitals had their origin in the borough, namely, St. Thomas's, which, starting in 1213 as a hostel for converts and boys, was devoted

in 1552 to the purposes of a sick hospital and was removed (1870) to the bankside of Lambeth, facing the Houses of Parliament, and Guy's (named after its founder, Thomas Guy), which was opened in 1725 and still remains in Southwark. Other noteworthy features of Southwark were the Fair, dating from 1550, which was held on St. Margaret's Hill on September 7th to 9th, and later (when painted by William Hogarth) lasted fourteen days, and was suppressed in 1763; King's Bench Prison, founded in the reign of Richard II. and disused as a debtors' prison in 1860, within the "rules," or privilege, of which resided for a time those gifted but wayward sons of genius, George Morland and Benjamin R. Haydon; the Marshalsea, in which Edmund Bonner, Bishop of London, died (1569), after several years' imprisonment; the Mint, where Henry VIII. had money coined for a few years, and which afterwards became flagrant as the haunt of vice and villainy; Lant Street, where Charles Dickens lived for a while when a boy; Tooley (that is, St. Olave's) Street, famous as the spot where three tailors palmed themselves off as "We, the people of England"; St. Olave's Grammar School, in Tooley Street, founded in 1561 by Queen Elizabeth (the name Olave perpetuates King Olaf's exploit of destroying an early, if not the earliest, London Bridge in the 11th century), and the market for hops and potatoes especially. Among later natives of Southwark were Eliza Cook, the poetess; Joseph Lancaster, the educator, and Dr. John Elliotson, to whom W. M. Thackeray dedicated the novel of *Pendennis*.

Southwell, a city of Nottinghamshire, England, 12 miles N.E. of Nottingham, on the river Greet, named from its well, of old reputed to possess wonderful healing properties. When the bishopric was created in 1884 (comprising the counties of Derby and Nottingham, formerly belonging to the dioceses of Lichfield and Lincoln), the magnificent structure of St. Mary's was advanced to the status of a cathedral. It was originally founded in 630 by Paulinus, the first Archbishop of York, and dates from the 12th century. The nave, transepts and towers are Norman, the choir, aisles and small eastern transepts are Early English, and the chapter-house is an extremely beautiful example of Decorated. In the Early English chantry on the eastern side of the north-west transept is kept the library, which includes the *White Book of Southwell*. To the south of the minster stands the ancient palace of the Archbishops of York, several of whom were intimately connected with the church, at least six of them having been interred within its precincts. Charles I.'s associations with the town were melancholy. He was there on August 18th, 1642, before he raised his standard at Nottingham; he was there again after his defeat at Naseby in 1645, and on May 6th, 1646, he surrendered himself at the "King's Arms" to the Scots Commissioners, then

occupying the archiepiscopal palace. There are silk and lace factories, and malting, brick-making and basket-making are carried on. Pop. (1901), 3,160.

Southwell, ROBERT, poet, was born about 1560, at Horsham St. Faith, 4 miles west of Norwich, Norfolk, England, and, after completing his studies at Douai College, became a Jesuit at Rome (1578). He returned to England as a missionary (1587), and his zeal in converting was so obnoxious to the authorities that he was thrown into the Tower of London in July, 1592, remaining there three years. He was finally executed at Tyburn on February 22nd, 1595, on a charge of disseminating Catholic doctrines in England. His poems are chiefly religious, and are often excellent. *St. Peter's Complaynt*, 1593, and *Mœnia*, a collection of hymns, published in 1595, are his best-known works. His prose writings are less familiar, but are deserving of praise.

Southwold, a watering-place of Suffolk, England, 12 miles S. by W. of Lowestoft. It is finely situated on rising ground facing the North Sea and enjoys a great reputation for its invigorating climate. The handsome Perpendicular church of St. Edmund contains many interesting features, the open rood-screen, the pulpit and the stalls being exceedingly good examples of carved oak. A carved Jack in armour, locally called "Jack smite the clock," above the vestry, warns the congregation at the beginning of every service of the entry of the clergy. This church escaped the great fire of 1659, which destroyed most of the town. The cliffs are beautifully laid out in promenades with shrubbery and flower-beds and there is a common, to the south, where golf is played. Gun Hill Cliff is so named from the battery of six 18-pounders presented in 1745 to the Corporation by the Duke of Cumberland. Fisheries, especially of herring, smelt, sprat and shrimp, are the leading industry, but brewing, iron-founding, rope-making and salt, sauce and pickle works are also carried on. In Sole Bay the British and Dutch fleets fought two obstinate battles in 1665 and 1672. In the former the Duke of York and Prince Rupert gained the day, but in the latter (May 28th) the encounter was long, bloody and indecisive, the Dutch being led by de Ruyter and the British by the Duke of York and the Earl of Sandwich, who lost his life in the engagement. Sutherland House in High Street was a favourite residence of the Duke of York, afterwards James II. Pop. (1901), 2,800.

Souza, JOAO, Orientalist, was born at Damascus, Syria, about 1730. Coming to Europe to complete his education, he settled in Lisbon and was appointed by the Marquis of Pombal interpreter to the embassy sent to Morocco in 1773. On the nomination of Queen Maria, he became Professor of Arabic and was then appointed to the Secretaryship of the Admiralty. Among his works were an *Arabic Grammar* (1787),

Remains of the Arabic Tongue in Portugal (1789) and *Arabic Documents in the Archives of Lisbon*. He died in Lisbon in 1812.

Souza-Botelho, JOSÉ MARIA, diplomatist, was of illustrious descent, and was born at Oporto, Portugal, in 1758, and educated at Coimbra. He entered the army in 1778, and left it in 1791, having obtained some recognition of his diplomatic abilities. He was successively minister of Portugal in Sweden, France, and the United Kingdom, and showed great firmness, patriotism and tact. He was an enthusiastic admirer of Camoens, and published splendid editions of that poet's works in 1817 and 1819. He was engaged upon a *History of Portugal* when he died in Paris in 1825.

Sovereignty, the power that resides in a person or community for its governance. When a person is permitted to arrogate absolute power, the sovereign then becomes a despot or autocrat and the people whom he rules, though ostensibly free, really enjoy only such a measure of self-government as, from prudential motives originating mainly in fear, he may think it proper to grant to them. In the case of a limited monarchy, the sense of freedom is greater, because the sovereign knows that his authority is qualified and that, were he disposed to push his power to an extreme, he would speedily be confronted with revolution, not necessarily bloody. When, however, the government of any society or state is completely and voluntarily organised on constitutional principles and none other, the people are perfectly free, being themselves—whether the form of government be monarchical, as in the United Kingdom, or Norway, or republican, as in the United States, or France, or Switzerland—the sovereign state, for though they may delegate authority to one person or to a body of persons, still in the last resort both the guiding hand and the directing voice are the people's. When, therefore, sovereignty is "broad-based upon the people's will" a condition of democratic government is reached in which the greatest happiness of the greatest number is assured.

Sowerby Bridge, a town of the West Riding of Yorkshire, England, on both sides of the Calder, 4 miles W.S.W. of Halifax. Till about the middle of the 19th century it consisted of some scattered houses, but since that period has grown to a manufacturing centre of considerable importance. It has worsted, cotton and corn mills, chemical, iron, dye and oil-cloth works. The principal buildings are Christ Church, originally established in 1526 but rebuilt in 1819, and the town hall. Archbishop Tillotson was a native of Sowerby parish on the right of the Calder. Pop. (1901), 11,477.

Sow-Thistle (*Sonchus*), a genus of succulent weeds belonging to the order Compositae, with the ligulate florets and milky juice charac-

teristic of the sub-order Cichoraceæ. The leaves are prickly and the flowers yellow. It is said to be relished by hares and rabbits, sheep, goats and pigs, but not by horses and cattle.

Soyotes, an isolated Samoyede people of South Siberia, Asia, near the sources of the Yenisei on both slopes of the Sayan Mountains. This region is supposed to have been the original home of the Samoyedes. In the same district are the Karagasses and other kindred tribes, who are now of Turki speech.

Spa, a watering-place in the province of Liège, Belgium, picturesquely situated amidst wooded hills in the valley of the Wayai, 16 miles S.E. of Liège. Many charming walks and drives have been constructed for the enjoyment of the *habitues*. The chalybeate springs became famous in the 16th century, when the fashion of drinking them was set by royalty and the nobility of different countries, and for many years a gambling establishment enhanced their attractions. The principal source is the Pouhon in the town itself, but there are several others scattered about the district. The counter-attractions of the numerous baths and springs which came into existence in Germany and France during the 19th century for a time threatened the prosperity of Spa, but in the long run it continued to hold its own. In course of time the word "spa" acquired general vogue as a synonym for a watering-place, appearing even in London at Beulah Spa and such now unlikely neighbourhoods as Clerkenwell and Bermondsey. Pop. (1901), 8,192.

Spadix, a form of inflorescence characterised by a fleshy peduncle and sessile flowers. It may be simple—i.e., a spike, as in aroids, or branched, as in some palms. The flowers on a spadix are often, but not always, unisexual, and are sometimes sunk in its fleshy surface. The spadix is generally enclosed in a large sheathing bract or spathe, and is the characteristic inflorescence of a series of Nudifloral Monocotyledons, the Spadicifloræ. The spadix of the common Lords-and-Ladies (*Arum maculatum*) is somewhat exceptional in its large club-shaped starchy appendix beyond its flower-bearing portion.

Spagnoletto. [RIBERA.]

Spain, a country which includes the greater part of the south-western peninsula of Continental Europe, the little kingdom of Portugal occupying rather less than one-seventh of the whole peninsula. Its coastal outline of remarkable symmetry presents some resemblance in appearance to a heraldic shield and its peninsular character is so strongly marked that it is known, *par excellence*, as The Peninsula. In the north the lofty ridges of the Pyrenees divide Spain from France, its other boundaries being the Atlantic and the Portuguese frontier

on the west and the Mediterranean on the south and east. The area of the country is 190,500 square miles, not quite four times that of England. The population numbers 18,618,086, including the Balearic Islands in the Mediterranean (311,649) and the Canaries off the north-western coast of Africa (358,564).

The highest summits in Spain are in the Pyrenees (over 10,000 feet) and in the Sierra Nevada in the extreme south (over 11,000 feet). The whole central portion of the country is a plateau averaging about 2,500 feet above the sea, this tableland being divided into wide valleys by the mountain ranges of "sierras" (*sierra*, "a saw," "a broken ridge of mountains or rocks"). Each valley is



Photo]

SPA.

[Neurdein, Paris.

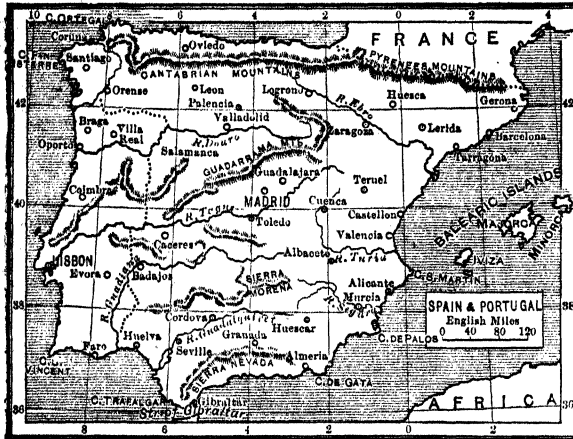
drained by a river the course of which is generally broken by rapids, bars of rock and gravel and other obstructions, so that even where there is a considerable volume of water the rivers are of little use for internal navigation. In some places they have been partly canalised and thus made available for traffic. The Ebro, the Guadalquivir, the Júcar and the Segura are the only considerable rivers flowing into the Mediterranean, all the rest having a westerly or south-westerly course to the Atlantic, the chief being the Miño in the north, bounding with Portugal, and, in the south, the Guadiana, which partly flows through Portugal, and the Guadalquivir. The Douro and Tagus, though rising in Spain, are more properly to be considered as Portuguese. The only lakes of any consequence are the coastal lagoons of Albufera in Valencia, Mar Menor in Murcia and Janda in Cadiz. Terns are numerous in the mountains. The fauna includes the genet, the porcupine, the ichneumon, the Barbary ape (the only monkey found wild in Europe), the lynx, vultures and eagles, the red-legged partridge, the blue magpie (whose most nearly allied species belongs to Eastern Asia), the flamingo, the hemipode, the eyed lizard, the grey amphispæna, the scorpion, the salmon, sardine, anchovy and tunny. The climate of Spain varies considerably. In the north, along the Biscay coast, it is often cold and rainy; in the south it is tropical during a great part of the year.

Spain is in the main an agricultural country, but fully one-half of the country is uncultivated, and indeed much of the mountain land is unfit for cultivation. The principal cereals are wheat, barley, oats, rye, maize, rice and millet. Garden and kitchen crops are several kinds of beans, peas, lentils, garlic, onions, tomatoes and Spanish pepper. The chief fruits are the grape (of prime importance), orange, olive, fig, almond, pomegranate, date, banana and other sub-tropical fruits. The sugarcane is extensively cultivated and cotton is grown. Spanish chestnuts and Barcelona filberts form, with raisins, a source of great profit. The north and the uplands of the centre afford grazing-grounds to herds of cattle and goats, and vast flocks of sheep and droves of swine. The asses and mules are the best of their kind anywhere and the rearing of bulls for the bull-ring is in some districts a very remunerative business. In the south especially

Spanish peninsula. The vegetation of Andalus and of Morocco is much the same; the little monkeys of the Rock of Gibraltar are the only animals of their kind living wild outside of Africa and, finally, there is some community of blood between the races on both sides of the Strait. The history of Spain is closely connected with that of Northern Africa. The question of the primitive population of the Peninsula is still a much-disputed one, the only certain point being that there was Celtic and a pre-Celtic race in the country, the Basques of Northern Spain perhaps representing the still earlier element in its population. The first historical references to Spain tell of the trade chiefly in metals, carried on by its southern districts with Phœnicia, Egypt and Greece. At these three countries sent their ships to trading ports on what is now the coast of Andalusia to bring back silver, copper and lead in exchange for

their own commodities. In this connection Spain is indicated in the Old Testament under the name of Tarshish or Tharsis. In the 3rd century B.C. the Carthaginians attempted regularly to conquer and colonise the Peninsula, and this brought them into conflict with Rome, and in the end the latter obtained dominion over the whole of Spain. The country remained a part of the Roman Empire till the barbarian invasions, and in the person of Trajan gave Rome one of its most famous soldier emperors. Latin became the language of the country. The Castilian or Spanish of today is a modernised form of Latin. Among classical Latin writers not a few were natives of Spain, the list including the names of Martial, Quintilian, and the Christian poet Prudentius. The first wave of barbarian invasion, that of the Sueves and Vandals, came over the Pyrenees in A.D. 409. Five years later they were followed by the still more formidable invasion of the Visigoths or West Goths.

Before the middle of the century they had driven the Vandals into Africa and cooped up the Sueves in the hills of Galicia and Asturias, and Spain formed a part of a Gothic kingdom extending from the Loire to the Strait of Gibraltar. After the death of King Euric (484) the Gothic power north of the Pyrenees fell before the Franks and henceforth the West Gothic kings ruled over Spain only. Teutons by race, Arians in religion, they and their nobles were at first a foreign ruling caste, separated in many ways from sympathy with the Latinised Spaniards. But the fusion of the two races was rapidly accomplished. One great cause of dissension was removed when King Recared (586-601) abjured Arianism and gave the Catholic bishops a place at his councils. Under King Suintilla (620-631) the last garrisons of the Greek Empire were driven from the coast, and under Chindasuinth (642-652) the laws of the two races, the Teutonic and the Latin, were fused into one code. The end of the 7th century witnessed the first raids of the Saracen fleets upon the coast, the ports of North Africa, which they had conquered,



SKETCH MAP OF SPAIN AND PORTUGAL.

wine-making is the most important industry, and the manufacture of corks is carried on in the same districts. In the towns of Catalonia, notably in Barcelona, there is a considerable cotton manufacture. Other leading manufactures are woollens, linens, silks, tobacco, sword blades (Toledo being noted still), leather, paper, sugar, porcelain and charcoal. The iron mines of the north, the great copper mines in the south (especially those of Rio Tinto), the mines of lead, silver and quicksilver, and the salt-making industry of the coast districts, also employ a large population. But there is still great room for industrial development in Spain, and even the agriculture of the country might be greatly improved, the old wooden plough of Roman days, little better than a big forked stick, being still used on many farms.

It has been said that "Europe ends at the Pyrenees." The saying is of course an exaggeration, but it is quite true that Spain forms in many ways a kind of borderland of Northern Africa. The mountain system of the Atlas is a continuation of that of the

being their base of operations. A rebellious nobleman, Count Julian, invited them to invade Spain in force in 711, factions among the nobles and the fierce hostility of the Jews, whom the Goths had



QUEEN VICTORIA EUGÉNIE
OF SPAIN.

(Photo: Beresford, Brompton Rd.)

persecuted, giving them good prospect of finding adherents in their enterprise. They landed near Gibraltar, and met and defeated Roderick, the last Gothic king of Spain, in the great battle of Guadalete, near Cadiz, which lasted a whole week (July 19-26, 711), beginning and ending on a Sunday. Roderick was seen no more after the fight, and his disappearance is the subject of many Spanish legends. Tarik—whose name survives in Gibraltar (Gebel-el-Tarik, "the hill of

Tarik")—was the leader of the force that subdued the "last of the Goths." Within ten years after the battle of Guadalete the Saracens or Moors had overrun the whole country except some of the mountainous districts of the north.

The history of Spain now runs in a divided channel. It is partly that of the Moorish kingdoms, partly that of the Reconquest. The Moors ruled over a greater or smaller area of Spain for seven centuries. The first four of these were the golden age of the Saracen power in the West. The Caliphs of Cordova were munificent patrons of learning and literature, and, if other arts were in abeyance under Moslem rule, that of architecture flourished: witness the magnificent mosque of Cordova, erected in the 8th century (now used as the cathedral). From the Moors of Spain, Christian Europe received the Arabic numerals and the Aristotelian philosophy. Averrhoes, the great commentator on Aristotle, was a Moor of Cordova. But the conquerors were divided among themselves. It was only for a time that they obeyed a single ruler, and their dissensions opened the way for the Reconquest. In the highlands of the north, new Christian kingdoms had been organised as the tide of Moorish conquest ebbed before the attacks of a hardier race. The kingdoms of Asturias and Oviedo were thus founded in the 8th century, Leon and Navarre in the 10th, and Aragon and Castile in the first half of the 11th. From this period the Moorish war continued with little interruption; there were occasional truces, never a lasting peace; and though the Moslems could boast of some victories, the fortune of war declared against them in the end. Toledo, once the old Gothic capital, was recaptured in 1085; Cordova, once the seat of the Western caliphate, was taken in 1236 by Ferdinand III. of Castile; Granada, the last of the Moorish kingdoms, was

conquered in 1492, the long siege of its capital forming the closing episode of the Reconquest. During the long war the minor kingdoms had been one by one united into more powerful states. The marriage of Ferdinand of Aragon with Isabella of Castile in 1481, the conquest of Granada in 1492, and the expulsion of the French from Navarre in 1512 united all Spain under one central Government. The Moorish war had not yet ended when a new and wider sphere of enterprise was opened to the chivalry of Spain. It was in the camp of Santa Fé, before Granada, that Isabella granted the request of Christopher Columbus to be allowed to open a new way to the Indies as a Spanish admiral. It was in 1492, the very year of the conquest of Granada, that he discovered the New World, and the first step was taken in the foundation of the Spanish empire beyond the seas, which soon included the West Indies, Mexico, Central America, Florida and California, and all South America excepting Brazil. Ferdinand succeeded in making good his claim as King of Aragon to rule over Naples and Sicily, and by the marriage of his daughter to the heir of the Hapsburgs it came to pass that the grandson of Ferdinand and Isabella, Charles V., united the sceptres of Spain and of the German Empire, and thus ruled over the greater part of Europe.

The reign of Charles V. saw the power of the Crown in Spain transformed from a limited into an absolute monarchy. The cities were played off against the nobles; the wealth derived from the Indies enabled the Crown to support a strong standing army; local privileges were abridged or abolished, and the Cortes became a mere deliberative assembly, which soon was not even asked to give its formal consent to taxation; and the Inquisition was used as a kind of Star Chamber for political purposes. This was the period of the greatest power of Spain. Its decline began in the latter part of the reign of Charles's son, Philip II. (1556-98). He succeeded in temporarily annexing Portugal to Spain; but he lost the Netherlands, where the harsh rule of Alva had provoked a revolt. The failure of the Armada crippled Spain upon the sea, and English, French, and Dutch adventurers preyed upon her commerce. By the end of the 17th century Spain had become a second-rate power in Europe. The extinction of the direct line of the royal house on the death of Charles II. in 1700 led



KING ALFONSO XIII. OF SPAIN.

(Photo: W. S. Stuart.)

to claimants for the throne being put forward by France and the German Empire. Hence arose the war of the Spanish Succession (1701-18), in which all the Western powers were involved either as principals or as allies. Great Britain in 1704 seized Gibraltar in the name of one of the rivals and kept it for herself. The Spaniards have never given up the hope of reconquering it, and still appoint a titular governor of the fortress, who resides at Algéiras. The war ended with the Treaty of Utrecht, which gave the throne of Spain to Philip V., of the House of Bourbon, it being stipulated that the two crowns of France and Spain should never be united on one head. During the 18th century the policy of Spain was in the main modelled on that of France. On several occasions the Spanish fleets and armies as the allies of the French unsuccessfully besieged Gibraltar. On the outbreak of the French Revolution Spain joined the other powers in the coalition against the Republic, but was forced to make peace. An alliance with Napoleon resulted in the Spanish fleets being destroyed by Jervis (afterwards Earl of St. Vincent) and Nelson, and a little later French treachery obtained the abdication of the king and the occupation of the fortresses by French garrisons, and Napoleon's brother Joseph was proclaimed King of Spain. A popular rising against the invaders, and the help of the British army under Wellington, secured after a long struggle (1807-14) the expulsion of the French and the restoration of the Bourbon kings. The reign of Ferdinand VII. (from the end of the Peninsular War to 1833) was marked at home by conflicts between the Liberal and Reactionary parties, in the course of which the king in 1823 called in the aid of a French army; and abroad, by the loss of the Spanish colonies in America, all of which except Cuba and Porto Rico drove out their Spanish Governors and declared themselves free republics. The death of Ferdinand in 1833 was followed by the first Carlist War, his brother, Don Carlos, endeavouring to obtain, in virtue of the old Salic law, the crown which Ferdinand had left to his infant daughter, Isabella II. The Regent, Queen Christina succeeded in defeating Carlos, thanks to British and French assistance. The reign of Isabella was disfigured by palace intrigues and military revolutions. It ended in 1868 by her flight in the presence of a military revolt. After two years of a provisional government, the crown was in 1870 accepted by Amadeus of Savoy. He only ruled for three years, during which he had to contend with the Carlists on the one hand and the Republicans on the other, the grandson of the first Carlos raising a formidable insurrection in the north, and the Republicans openly plotting against the foreign king. On his abdication in 1873 the Republic was proclaimed, but dissensions among its supporters and its failures to suppress the Carlist insurrection led to the recall of the Bourbons in December, 1874 in the person of Alfonso XII., the son of Isabella. In 1876 Carlos gave up the struggle in the north. Alfonso died suddenly in 1886, and Spain was ruled for many years by his widow, Queen Christina, acting as Regent for her son, Alfonso XIII., born in May, 1886,

some months after his father's death. Under his rule Spain made considerable progress towards stable government, but the curse of the country past had not yet lifted and it had to drain to the dregs the cup of national humiliation and sorrow. Throughout its history, and since the period of Absolutism and the Inquisition particularly, Spain has had to expend enormous sums to defray the cost of ruinous civil wars at home and of the suppression of formidable revolts in America and Cuba. A number of fortified posts on the coast of Morocco are garrisoned by Spain, which vainly cherishes the hope of succeeding to the control of the whole country when the Moorish power finally goes to pieces. Little wars with the tribes in the neighbourhood of these places have been carried on with a vigour which shows that the old spirit of the War of the Reconquest is not dead in Spain. It was ever easy to obtain eager volunteers in Spain for war against the Moors, although to the onlookers other nations, who proverbially "see most of the game," it was yearly becoming more and more a parent that the coveted Moroccan prize was slipping from its grasp, and now all that is left to Spain is its ancient and widespread empire are the Canaries in the Atlantic and a few posts in Africa. In 1898 the United States called upon Spain to put an end to the misgovernment in Cuba, or to withdraw from the island. Spain refused to recognise the right of America to intervene, and war ensued. Spain was defeated, and compelled to give up Cuba, Porto Rico and the Philippines, and in 1899 the Caroline Islands were sold to Germany. When therefore, at this same year, Spain closed its Colonial Office for ever, it bowed to the inevitable, but there was a cruel pathos in the acquiescence that spoiled the nation's anguish. But the decision of the sovereign and statesmen to concentrate attention and energy upon home affairs was wise and a new regenerated Spain is not beyond the bounds of hope and probability. In 1902 Alfonso XIII. came of age and assumed the reins of government. On May 31st, 1906, he married, in Madrid, the Princess Ena of Battenberg, a niece of Edward VII. The ceremony did not pass off without untoward accident, for when the newly-wedded couple were returning from the church of San Geronimo a box was hurled at them. They escaped injury, but the dastardly outrage claimed several victims. It was decided that the queen was to be styled Victoria Eugénie. On May 10th, 1907, a son was born to the king and queen. In Spain the government is vested in a hereditary monarchy and the Cortes, or Parliament, consisting of a Senate (one-third of which are hereditary legislators, one-third are nominated by the sovereign for life and one-third are elective) and a Chamber of Deputies, elected by universal suffrage in the proportion of one Deputy to every 50,000 inhabitants. The Catholic is the State religion of the "most Catholic" kingdom in the world, but other forms of religion are viewed with a toleration that has unhappily been somewhat slow in the growth.

The extensive remains of Moorish architecture give an Oriental aspect to most of the southern cities of Spain, the cathedral of Cordova, the

Alcazar of Seville, and the palace of the Alhambra at Granada being the most striking examples. Christian architecture in Spain is a very ornate Gothic, of which the splendid cathedral at Burgos is the typical example. In art the most famous name in Spain is that of Velazquez. In literature the names of Cervantes, the author of *Don Quixote*, and Calderon, the dramatist, have become world-famous; but these are only two among the many names deservedly held in honour in Spain itself as poets, dramatists, historians, or romancists. Other Spanish names that have won a world-wide reputation are those of Ignatius of Loyola, the founder of the Jesuits, and Francis Xavier, the great missionary, both of them of the Basque race of the north.

Spalato, or SPALATRO, a city of Dalmatia, Austria, on the Adriatic, situated on the eastern side of the peninsula dividing the Gulf of Brazza from the Gulf of Salona, 160 miles S.E. of Fiume. It is noteworthy for the remains, in a good state of preservation, of the palace which the Emperor Diocletian caused to be erected for him on his retirement from the purple in A.D. 305. This colossal structure occupied nearly eight acres. Quadrangular in plan, the faces corresponded to the four points of the compass. The Porta Aurea, or Golden Gate, of the western front was the main entrance to the building. The main street from each gate met in the centre and was lined with arcades. The mausoleum of Diocletian was transformed into the cathedral towards the middle of the 7th century, and a temple of Æsculapius was afterwards used as a baptistery, both edifices lying within the precincts of the palace. Three or four miles to the north-east are the ruins of Salona, which was repeatedly ravaged by the barbarians in the 5th and 6th centuries. In 639 the Avars attacked and destroyed it, the inhabitants fleeing for shelter to the palace of Diocletian. Here they remained, practically converting the building into a town. They could plead in justification, besides the necessities of their case, the fact that part of it had been employed as a cloth factory soon after Diocletian's death. Spalato is a bishopric, has a most interesting museum of antiquities, and does a brisk trade in wine and oil. Pop. (1900), 27,198.

Spalding, a town of Lincolnshire, England, on the Welland, 14 miles S.S.W. of Boston. The river divides it into two portions, of which the area on the left bank is the larger. It is navigable for vessels of 80 tons, and the embankments between here and the Wash are believed to be of Roman workmanship. Traces of the castle built when Spalding was a prominent place in the kingdom of Mercia can yet be made out and there are remains of the 15th-century Benedictine Priory, in succession to an earlier monastery, of which Fulney Farm, a mile and a half to the south-east, dating from 1080, is supposed to have been the dairy farm. The church of St. Mary and St. Nicholas, originally Early English, was rebuilt in 1294 and contains several Decorated and Perpendicular features. Other buildings are the Corn Exchange, the Masonic Hall, Johnson Hospital, the Christian Association and Literary Institute, the Mechanics' Institute,

Gamlyn's Almshouses (founded in 1850) and the Grammar School, of which the well-known scholar, Richard Bentley, was appointed headmaster in 1682. There are flour- and saw-mills, and great quantities of fruit and vegetables are grown for London and other markets. Pop. (1901), 9,385.

Spalding, WILLIAM, man of letters, was born in Aberdeen, Scotland, on May 22nd, 1809, and studied at Marischal College in his native city. He qualified as an advocate in 1833, but soon showed a strong bent towards literature and a mastery of the Elizabethan drama. He was elected Professor of Rhetoric and Belles Lettres in Edinburgh University in 1840, and exchanged the chair for that of Logic, Rhetoric and Metaphysics at St. Andrews in 1845. Besides several articles in the *Edinburgh Review*, which attracted general attention, he produced an edition of *Shakespeare's Works* (1845) and a book on *Shakespeare's Critics* (1849). In 1858 he published his *History of English Literature, with an Outline of the Origin and Growth of the English Language*, an admirable compendium, which came into almost universal use as a textbook and still enjoys a wide vogue. He died in St. Andrews on November 16th, 1859.

Spallanzani, LAZARO, physiologist, was born at Scandiano, in Modena, Italy, on January 12th, 1729, and studied at Reggio di Modena and Bologna. He was a versatile man, being equally accomplished in natural science, physics, physiology and literature. He filled the chairs, successively, of Logic, Metaphysics and Greek at Reggio (1754-60) and Modena (1760-9) and of Natural History at Pavia, whither he was summoned in 1770. In 1778 he explored Vesuvius and the Lipari volcanoes, in 1781 the east coasts of the Mediterranean, and in 1785 Turkey. He died at Pavia on February 12th, 1799. He was an industrious investigator, but particularly distinguished himself by his researches in physiology, especially on the senses of bats, respiration, spontaneous generation (the possibility of which he disproved) and reproduction. He was the first to elucidate the true processes of digestion, demonstrating his theory by the means of artificial digestion experimentally conducted outside of the stomach in sealed tubes. His chief works were *Dei fenomeni della circolazione* (1777), *Opuscoli di fisica animale e vegetabile* (1777), *Dissertationi di fisica animale e vegetabile* (1780) and *Viaggi alle due Sicilie* (1792).

Spandau, a fortified town in the province of Brandenburg, Prussia, 8 miles W. by N. of Berlin, at the point where the Havel joins the Spree. It is a place of considerable antiquity, receiving town rights in 1232, and for many years served as a prison and treasury, a large gold reserve being kept in the Julius tower of the citadel for military emergencies. The works have been greatly strengthened of late years, and large factories have been erected for guns, powder and all the munitions of war. Boat-building, fishing and miscellaneous manufactures are the minor industries. It was taken by the Swedes in 1635, by the French in 1806, and restored to Prussia in 1813. Baron

Trenck was imprisoned here about 1760. Pop. (1900), 65,014.

Spaniel, a general name for several breeds or strains of the domestic dog, agreeing in their silky coat and affectionate disposition, intelligence, and very decided power of scent, though differing much in size and appearance. They fall into three groups:—(1) Land or Field Spaniels, used chiefly to flush game. Here belong the Cocker, with long hair, very long drooping ears and an elevated tail, and, owing to its small size, able to enter thickets to flush woodcocks and pheasants, which Setters and large dogs cannot enter; and the Springer, a larger, stronger and steadier dog, from which the Clumber, Sussex and Norfolk Spaniels have sprung. (2) The Water Spaniels, an Irish breed, the largest of the group, with reddish-liver coat, used in shooting, in which it not only finds the game but also brings it unmangled to its master. (3) Toys. Of these the Blenheim Spaniel is a good example. The King Charles differs from it in its black-and-tan coloration. In the latter the Spaniel characteristics appear in exaggerated form. The forehead is round and prominent, the eye is large and moist, the coat is long and silky, and the ears are pendulous. The toys are drawing-room pets. The King Charles has been rendered familiar by Sir Edwin Landseer's famous picture of "The Cavalier's Pets."

Spanish Fly. [CANTHARIS; BLISTERING.]

Spanish Main, the term commonly applied, especially in the days when Spain was supreme on the Continent, to the north-eastern coast of South America between the Orinoco and the Isthmus of Panama. Occasionally it was also used of the Caribbean Sea, from the secondary sense of "main" as an expanse of ocean.

Spar, now merely a popular term, generally applied to any translucent and distinctly crystalline mineral, such as rock-crystal, calc-spar, fluor-spar, fel-spar, etc. In 1820 the German mineralogist Friedrich Mohs (1773-1839) attempted to use it as a classificatory term, including under it most silicates.

Sparks, JARED, President of Harvard University, was born at Willington, in Connecticut, United States, on May 10th, 1789. He was enabled to study at Harvard, and was made tutor of mathematics and natural philosophy in 1817. He read theology deeply, and in 1819 was ordained a Unitarian pastor, writing several theological treatises. Retiring in 1823 from the ministry, he settled in Boston, where he purchased and edited from 1824 to 1831 the *North American Review*, during which period he made an extended visit to Europe in search of materials for his *Life of Washington*. In 1832 he produced his valuable *Life of Gouverneur Morris*, and between 1834 and 1838 *Life and Writings of George Washington*. He also published an edition of Benjamin Franklin's works (1836-40), and edited *The Diplomatic Correspondence of the American Revolution* (1829-30). He was Professor of Ancient and Modern History at Harvard from 1839 to 1849, was President of the College from 1849 till 1853, and died at Cambridge, Massachusetts, on March 14th,

1866. He left unfinished a *History of the American Revolution*.

Sparrow, a genus (*Passer*) of birds of the Finch family, with about thirty species, confined to the Old World. The bill is strong and subconic



SPARROW
(*Passer domesticus*).

with the nostrils at the base half-hidden by projecting and recurved frontal plumes; tail moderate long and nearly square; claws rather short and curved. The House Sparrow (*P. domesticus*) common over the British Islands, Europe, and the north of Asia. The length is about six inches; the male has the mantle brown striped with black, the head bluish-grey, the cheeks greyish-white, the front of the neck black, and the under parts light grey. On the wings are two narrow bands, one white and one rusty yellow. The female is more plainly clad. These birds are omnivorous; they do much damage to grain and fruit crops, but it is a question whether they do not more than repay the damage by the vast quantities of insect larvae they kill for the purpose of feeding their young. Opinion is divided as to whether the sparrow should be reckoned among the farmer's friends or foes. I. Coues, the American ornithologist, regards the introduction of this bird into the United States, for the purpose of destroying harmful insects, as a mistake, and speaks of it as a pest and a curse. The Tree Sparrow (*P. montanus*), with a more restricted range, differs little from the House Sparrow except in its smaller size.

Sparrow-Hawk, a bird of the Falcon genus Accipiter, with six species almost universally distributed. They are allied to, but smaller than, the Goshawk. The Common Sparrow-Hawk (*A. nisus*) is about a foot long, dark-brown on the upper surface, with the under surface rusty-brown barred with dark bands. The female is somewhat larger and has the ground-tint of the under surface greyish. These birds are fairly common in the United Kingdom, though they are relentlessly persecuted by gamekeepers on account of their preying on young game birds. So keen are they in the pursuit

of prey they have been known to dash through windows and been caught in the room, while it is recorded that a trained Sparrow-Hawk penetrated so far into a blackthorn bush, where it had slain a bird, that it had to be cut out.

Sparta, or LACEDÆMON, next to Athens, the most powerful state in ancient Greece. It was less a city than a cluster of villages occupying a plain on the west of the river Eurotas between the heights of Taygetus and Parnon, and almost in the centre of the Peloponnesus. The rise of this rustic city to be the head of Laconia, the supreme power of the peninsula, and the rival first of Argos and then of Athens, dates from the reforms of Lycurgus in the 9th century, but was due also to certain racial characteristics which it is impossible to trace to their source. The Spartans represented throughout history the aristocratic and agricultural interests as opposed to democracy and commerce. To push these principles she colonised, and meddled in the affairs of other states; but selfish isolation was the keynote of her policy. To secure her influence she could temporise with Persia, massacre her helots, and stamp out liberty in neighbouring states. Now and then she seemed to be inspired with national enthusiasm, but the fit was short-lived, and usually ended in petty oppression. The periods of her greatest influence were in the 6th century B.C., when she took the lead in crushing out the popular tyrannies, in the 4th century, when Athens was ruined by the defeat at Ægospotami (405 B.C.), and in the 3rd century, when she resisted Pyrrhus and endeavoured to form the Achæan League. Nabis, a low freebooter, then made himself master of the city of Menelaus, and Philipæmen razed the walls to the ground. In the middle of the 2nd century Rome stepped in, and a few ruins near Mistra and Sparti, the present capital, are all that is left of one of the most famous of human communities.

Spartacus, leader of the Italian gladiatorial revolt, was a Thracian by birth, and was originally a shepherd. The year 113 B.C. has been assigned as that of his birth. Very little is known of his career, but it is certain that after the conquest of Macedonia he was forced to serve in the Roman army, and his size and strength led to his being selected for training as a gladiator. In 73 he organised a rebellion of his fellow-slaves, and their number, originally 70, increased, it is believed, to 70,000. For a time they were brilliantly successful. Spartacus having a genius for generalship defeated or outwitted the Roman commanders opposed to him, and it was his real misfortune that the hordes at his disposal were undisciplined ill-used men. Had they loyally supported Spartacus, whose aim was to conduct them out of Italy altogether so that they might reach their native countries, there is every reason to believe that he would have achieved this object. But the chance of plundering unprotected communities appealed to their cupidity and cruelty, and they made themselves detested by their abominable excesses. Spartacus stood by them, however, in spite of their crimes and foolishness; but at length,

after a struggle which has earned the admiration of the world, they were defeated by Crassus, and their gallant and capable general was killed in 71.

Spasm, the involuntary contraction of muscle. Spasm is tonic or clonic. [CONVULSIONS.] The ordinary "cramp" affecting the muscles of the calves of the legs is a good instance of muscular spasm. In tetany the spasm affects the muscles of the hands and feet. The muscles of the eyes are sometimes thrown into a condition of spasm producing deviation of the eyeballs such as occurs in the "inward fits" of children. Contraction of the muscles which close the eyelids produces what is known as blepharo-spasm. When the muscles of the mouth are affected, cynic spasm is produced. The common form of wry-neck is due to muscular spasm. Epilepsy, chorea, and tetanus are diseases in which spasm of muscles plays an essential part. Spastic paraplegia is a condition met with in a peculiar form of disease affecting the spinal cord.

Spatangoidea, an order of Sea Urchins or Echinoidea including those in which the anal aperture opens outside of the "apical system," and is not on the extreme upper point of the shell or test, and which have neither external gills nor an internal series of jaws or teeth. It is divided into two sub-orders, the Cassiduloides and the Spatangoidea, of which the latter includes the more typical forms such as the Common Heart-Urchin or Sea-Bun (*Spatangus purpuraceus*), the common Chalk fossils, *Micraster* and *Æchinocorys*.

Spathe, a large sheathing bract enclosing a whole inflorescence, and occurring almost exclusively among Monocotyledons. It may be herbaceous, as in Lords-and-Ladies; petaloid, in texture and colour, as in the Trumpet-Lily (*Richardia athiopica*); or membranous, as in Narcissus and in the Palms. In the Daffodil it only encloses a single flower; but in other species of Narcissus, such as the Jonquil, as in most other cases, a number. The spathe of the Date Palm is commonly used in Southern Europe for packing oranges.

Spathic Iron Ores consist of the carbonate of iron in a comparatively pure state, with but little admixture of earthy matter. The carbonate of manganese is, however, frequently present, but this is not detrimental as it enhances the value of the ore for many purposes. The ore when pure forms rhombohedral crystals of a white colour, but is usually yellow or brown. The chief localities where it occurs are Durham, Somerset, and Cornwall in England, in the Austrian provinces of Styria and Carinthia, and in Prussia.

Spavin. [BOG SPAVIN.]

Speaker, THE, the presiding officer of the British House of Commons, and as such taking precedence as the First Commoner. He is elected in each Parliament from among the members, is not necessarily chosen from the party in power, and, if returned to the House at the General Election, is eligible for re-election. His chief duties are to regulate debate and preserve order under the rules of the House. In the case of an equal

division he gives a casting vote and is entitled to speak in Committee of the whole House, the chair being occupied in such a session by the Chairman of Committees. In crises his responsibility is extreme. During the illegal incidents leading up to the Civil War, the position of Speaker was very trying, but his obedience was to the House and not to the monarch acting arbitrarily and outside of the Constitution. Sir Peter de la Mare, elected for Hereford in 1376 in the Parliament known as the Good Parliament, was chosen Speaker, and is the first on record, although Sir Thomas Hungerford is the first whose name appears in that character in the rolls of Parliament. Charles II. refused his assent to the choice of Sir Edward Seymour in 1678, and Sir William Gregory was elected in his stead. The number of Speakers who have been false to their trust is exceedingly few, but Sir John Trevor was expelled for accepting a gratuity in 1695. The most dramatic incident in modern times was witnessed in 1881, when Mr. Speaker Brand (afterwards Viscount Hampden), *proprio motu*, refused to hear any more speeches in the debate for leave to introduce the Coercion Bill. W. E. Forster had moved for leave on January 31st, and, after a sitting of 41 consecutive hours, the Speaker intervened as stated at 9 a.m. on February 2nd. His action was undoubtedly illegal, but the House accepted the situation, and reformed rules of procedure enlarged the Speaker's powers of dealing with obstruction. When the Speaker retires finally, he is customarily raised to the peerage. In the House of Lords the Lord Chancellor officiates as Speaker. The presiding officer of the United States House of Representatives is also known as the Speaker, but in that assembly he is avowedly a partisan, as a rule, the leader of the party having a majority of the members being elected to the post. He possesses the power of appointing all committees and, as a member, can take part in a debate after calling another member to the chair, and can vote on all questions. The latter rights, however, are seldom exercised.

Speaking Trumpet, an instrument which forms, as it were, a sounding-board for the voice, and enables speech to be heard, especially in certain circumstances, at a far greater distance than would otherwise be possible. It consists of a cone cut near its apex to form a convenient opening into which to speak. The other end is curved slightly outwards. The compressions and expansions of the air in the trumpet are protected from the effects of violent wind outside; hence the whole of the air just outside the opening is set in motion by the waves of sound. Without the trumpet the initial waves would have been destroyed in a storm, or at any rate much weakened before they had traversed a distance equal to the length of the trumpet. The instrument is of great use at sea in enabling orders to be heard across the ship in boisterous weather.

Spear, a generic weapon, the prototype of the whole race of throwing and stabbing weapons. The early spear consisted doubtless of wood sharpened at the end and hardened by fire. The next steps were to head it with fish-bone, flint,

bone, shell, and eventually metal, the finishing touch being to poison the point. The median lance was sixteen feet long. The spear has existed side by side with the javelin, and the Matabele warrior had ancient precedent for carrying his long assegai and his stabbing assegai. The period before weapons of precision came in vogue, the spear was a formidable weapon, particularly in the formation drawn up to receive a horde attack. Many an onset of cavalry has gone pieces on a forest of spears. In sport, the spear still used in wild-boar hunting, and in some kind of fishing, and in the case of whale-catching it sometimes fired from a gun. The modern cavalry lance, from eight and a half to eleven feet long, becoming more general as the work of cavalry war becomes restricted to reconnoitring and pursuing.

Species, the unit of classification for animals and plants—that is, a collection of individuals (specimens) that make up a genus. So long as naturalists held the doctrine of fixity of species there was no difficulty in framing a definition of the term, for the dictum of Linné was generally accepted that "there were as many species as the Infinite Being had created forms in the beginning. This, if true, would fix the origin of species, and from this it followed that a species was "a group of organisms, descended from a pair divinely created, possessing similar characters, and capable of reproducing organisms like themselves." Lamarck in the early part of the 19th century suggested that species were subjective, and not objective, but the influence of Linné prevailed, and it was not till the publication of Charles Darwin's *Origin of Species* in 1859 that the Linnean conception was replaced by the theory of Evolution. Since that date, though the term "species" is retained as a convenient one for a group of individuals agreeing in essential characters which can be transmitted to their descendants, it is recognised that it is incapable of strict definition, and that what one naturalist would class as a species another would class as a mere variety, while a third would possibly give it generic rank. Professor E. Ray Lankester in his article on "Zoology" in the *Encyclopædia Britannica*, says that "Species, as well as genera, orders, and classes, are the subjective expression of a vast ramifying pedigree, in which the only objective existences are individuals." The truth of this will be evident on consideration; and if proof were needed, it would be afforded by a comparison of the classifications of different naturalists, especially those dealing with the lower forms of life. There is comparatively little difficulty in separating the larger animals into species, but the nearer one gets to the base of the genealogical tree the more hopeless does the task become of drawing with a firm hand the dividing line between species and variety, so closely do many of the forms approach their neighbours on each side.

Specific Gravity. The absolute specific gravity of a substance is the weight of matter contained in a unit volume of the substance. In absolute C.G.S. units this would be expressed as a

many degrees per cubic centimetre, and would vary at different places on the earth's surface. In practice, however, gravitation units of force are always used, so that the absolute specific gravity is given as so many grammes per cubic centimetre, and the number expressing this is identical with that expressing the absolute density of the substance. The absolute specific gravity can also be expressed in terms of the pound, cubic foot, or other units. The relative specific gravity of a substance with regard to some standard substance is the ratio of the weights of equal volumes of the two substances. This is seen to be the same as the ratio between the absolute specific gravities of the substances; for let the weight of v volumes of the standard A be w_A , and that of v volumes of some other substance B be w_B . Then the specific gravity of B relative to A is $\frac{w_B}{w_A}$, but this is the

same as $\frac{w_B}{v} \div \frac{w_A}{v}$, the absolute specific gravities of the two substances. It is usual to take water at 4°C. as the standard substance, and then if we use the C.G.S. system, the absolute and relative specific gravities are expressed by the same number, because the unit of weight—the gramme—is the weight of the unit volume—the cubic centimetre—of water at 4°C. [DENSITY.] But this is not the case if we take, for instance, the cubic foot as the unit volume and the pound as the unit mass, or gravitation unit of weight. One cubic foot of steel weighs $487\frac{1}{2}$ lbs.; so, using these units, its absolute specific gravity would be 487.5 . One cubic foot of water weighs $62\frac{1}{2}$ lbs.; so its absolute specific gravity would be 62.5 . The relative specific gravity of steel with regard to water would be, therefore, $487.5 \div 62.5 = 7.8$. The relative specific gravity is, of course, the same whatever units we take, but in dealing with the variation of specific gravity of liquids at different temperatures it avoids much confusion always to use the absolute specific gravity in C.G.S. units, because there can be no ambiguity with regard to the temperature of the standard substance. Specific gravity of liquids may be measured by means of hydrometers, or more accurately with pyknometers, which are various modifications of the specific gravity bottle. A usual form consists of a cylindrical bulb of thin glass with a thick glass neck of fine bore. The top of the neck is expanded and fitted with a well-ground stopper, while upon the neck is etched a fine scale. Preliminary experiments give the volumes of the bulb and neck up to each mark, so that all that need be done in determining the specific gravity of any liquid is to weigh the bottle when empty and when containing the liquid. The difference in the two weights gives the weight of the liquid; its volume is seen at once, and division of the weight by the volume gives the absolute specific gravity. Special apparatus is used for the determination of the specific gravity of gases.

Spectacled Bear (*Ursus ornatus*), a bear, from the Peruvian Andes, measuring about three

feet and a half in length. The fur is black, and there is a light-coloured ring round each eye. The greater part of the face being black, these rings have the appearance of a pair of goggles, "through which," says Professor Jeffery Parker, "the beast seems to look with an air of mingled wisdom and imbecility." From this feature is derived the popular name.

Spectacles are lenses or other refracting objects used for aiding the sight when the eyes are defective. Spectacles of convex lenses are supposed to have been invented about the end of the 13th century, and are used by long-sighted people. These produce a virtual image of the object farther away than the object from the eye, and hence at a more convenient distance for a long-sighted person. Concave lenses were used soon after the others in spectacles for short-sighted people, an image being produced nearer than the object to the person. These are the commonest forms of spectacles; but other kinds are used in certain cases—e.g., prisms are employed in some cases of squinting, and cylindrical lenses are used to remedy astigmatism. It was at one time the rule to number lenses according to their focal lengths given in inches, but the system was not convenient, especially as the inch is not a universal unit. A more scientific system is one in which

1 is taken as the number; this has been focal length named a "dioptric," when the metre is the unit of length. The number of dioptries therefore varies directly with the refractive power or strength of the lens. Spectacles may be furnished with blue, green, or other-coloured lenses to protect weak eyes from the glare of light. In divided spectacles the lens is composed of two parts of different focus exactly united, one part for observing distant and the other near objects. Spectacles which have no temples or ear-rests and are supported on the nose only by means of a spring are called *pince-nez*. The single eye-glass is known as a monocle. Contrary to the general opinion, it was not invented by Joseph Chamberlain.

Spectroscope. [SPECTRUM.]

Spectrum. Light, coming from any source can by suitable means be split up into its component parts. This was first discovered by Sir Isaac Newton, who allowed a fine beam of sunlight to enter a dark room through a small hole in the shutter. If allowed to fall unmolested upon a screen, an image of the sun was formed there, but when a prism was placed in its path, instead of a round image of the sun, there appeared a brilliantly coloured band upon the screen. In the accompanying diagram (Fig. 1) $H A$ is the beam of sunlight entering at H , and tending to form the sun's image at A' . The interposed prism, P , however, affects the beam at A , and $v R$ is the long band of colour formed on the screen. This coloured band was called by Newton a spectrum, and the colours vary gradually from violet (v) through indigo, blue, green, yellow, and orange to red (R). It is noticed that the violet ray is bent most away from the

original direction, $H A^1$, of the beam. Hence the waves of violet light are said to be the most refrangible and those of red light the least refrangible of the visible spectrum. However, our

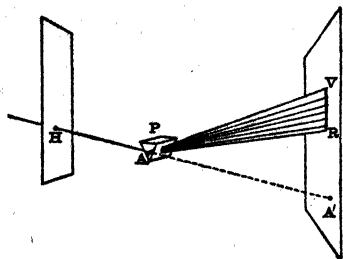


FIG. 1.

eyes are by no means able to detect the whole of solar radiation. Beyond the violet end of the spectrum there are waves capable of promoting active chemical decomposition, and this is specially the case with regard to silver salts. The presence of these ultra-violet waves can be shown in another way. Their rate of vibration is extremely rapid, but, if they fall upon some substances such as fluorescein or quinine sulphate, they produce slower vibrations in these bodies, and hence the eye is able to detect them. Bodies which possess this power are said to be fluorescent, and Professor Sir James Dewar has shown that many bodies which are not fluorescent at ordinary temperatures, become brilliantly so when extremely cold, at about -180° C. If, therefore, we let the spectrum fall, not upon a white screen but upon one painted with quinine sulphate, we shall see the screen rendered luminous where it was originally dark beyond the violet end. Just as there are vibrations of too frequent periods to be detected by the eye, so also are there waves whose vibrations are too slow, and these occur beyond the red end of the spectrum. We constantly experience the fact that heat and light are in the habit of accompanying each other, and, if we examine different parts of the spectrum with a sensitive thermometer, we find the temperature low at the violet end but rising in the red part,

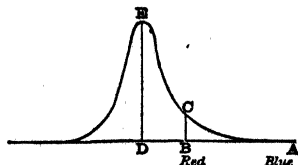


FIG. 2.

and continuing to rise rapidly in the invisible region beyond the red, until a maximum temperature is reached, after which it rapidly falls. The accompanying diagram (Fig. 2) exhibits this alteration in temperature. AB is the length of the visible spectrum, and the height of the curve above this line represents the heat at each point. Thus,

BC is proportional to the temperature at B , the e of the red spectrum, and DE is the maximum temperature at some point, D , in the ultra-red part. Every substance does not behave in the same manner to different radiations; by passing the light through a cell containing a solution of alum we can stop all the heat and let only the light through; using a solution of iodine in carbon bisulphide we can get rid of the light and leave the radiant heat invisible to our eyes, but capable of all the heating effects possessed by the original beam. Instead of using sunlight for obtaining a spectrum, it is generally more convenient to use artificial light. If, however, we examine the light of an incandescent vapour, we find that we do not obtain a complete spectrum. A strong electric current is capable of heating silver to such an extent that it boils; vapour is then seen to be green in colour; and, this light being seen through a prism, its spectrum simply consists of two green bands. Zinc, treated in a similar way, gives bands in the red and blue parts of the spectrum, but only darkness exists where the other colours might be. What is true of silver or zinc applies to every other metal; the heated vapour of each gives rise to its own particular bands and no others, and the bands are never the same for any two metals. Further, these bands are given

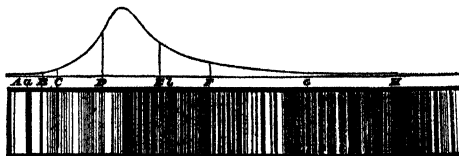
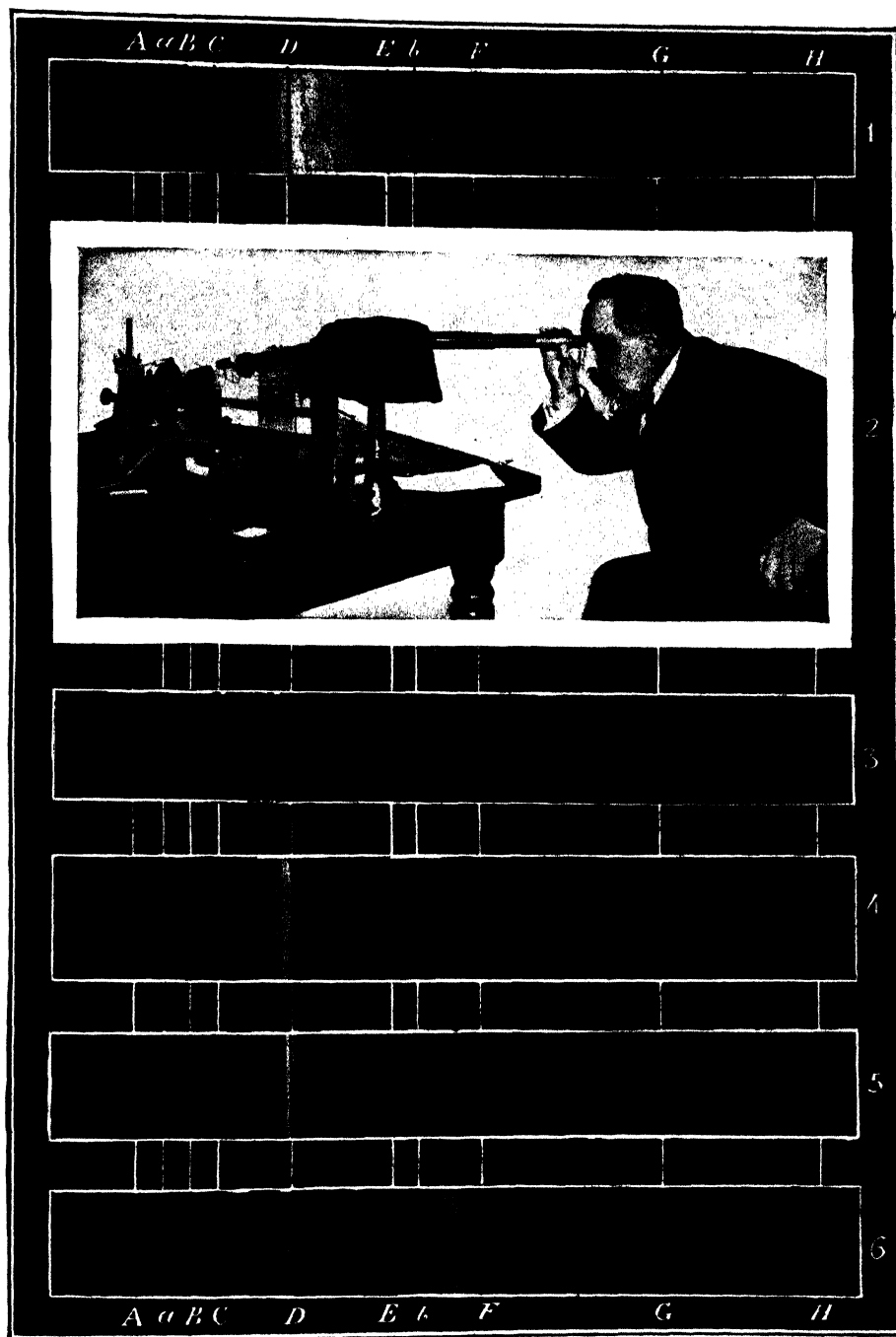


FIG. 3.—FRAUNHOFER'S LINES.

when the metal is present in any form whatever. Sodium concealed in common salt, or copper hidden in brass, give their definite and unmistakable bands. An optical examination of the incandescent vapour of a substance must therefore prove the presence of any metal which it contains. This method of examination was first used by Bunsen and Kirchhoff, and is known as *Spectrum analysis*. The metals Cæsium and Rubidium were discovered in this way, for the substance containing them was found to give bands which did not agree with those obtainable from any known metal. Examination of substances in this way is usually performed by means of an instrument known as a *Spectroscope*. In this instrument the only light which can reach the observer comes through a very fine slit at the end of a tube. The fineness of the slit is necessary to obtain a pure spectrum—i.e., one in which there is no overlapping of the different colours. In this tube is placed a convex lens, called a collimator, at a distance equal to its focal length from the slit. Light from the slit is therefore rendered parallel by the lens, and falls upon a prism suitably adjusted in position. If, instead of actually observing the effects, a telescope is used, now, so long as we are dealing with the light of an incandescent solid, we shall observe a continuous and pure spectrum. With an incandescent vapour



SPECTRUM ANALYSIS.

1. CONTINUOUS SPECTRUM WITH FRAUNHOFER'S LINES.
2. A SPECTROSCOPIST AT WORK
3. SPECTRUM OF STRONTIUM.
4. ABSORPTION SPECTRUM OF ARTERIAL BLOOD, DILUTED 1 IN 400.

containing no solid particles we have independent bright bands. But it was for long observed that a pure spectrum of the sun exhibited a number of dark lines interrupting the range of colours. A few of these were first noted by Wollaston, but many



FIG. 4.—SPECTRUM OF ALPHA LYRÆ.

more were found by Fraunhofer, who characterised their positions; they are hence known as *Fraunhofer's lines* (Fig. 3), and called by the letters which he gave to them. The explanation of these lines is due to Kirchhoff. It had been noted by Fraunhofer that the dark lines D of the solar spectrum coincided exactly in position with the bright lines given by the yellow incandescent vapour obtained by burning alcohol containing salt. Kirchhoff obtained a weak solar spectrum with its characteristic D lines; on making the light pass through the salt flame, however, he got two bright lines instead—the bright lines of sodium; he then increased the intensity of his solar spectrum, still passing the light through the salt flame, and, as he did so, the bright D lines gradually faded away until at last they appeared much darker than when given by the solar light alone. Kirchhoff now obtained a pure spectrum by means of a limelight, passed the light through the salt flame, and got his spectrum interrupted by two dark lines, corresponding exactly with the D lines of the solar spectrum. It was, therefore, the case that the salt flame picked out from the complete spectrum just those waves which were the ones it could itself actually emit. It absorbed the rays which it would radiate. In the case of the experiment with the feeble solar light, when the D lines appeared rather bright, the radiation by the salt flame exceeded its absorption of the same light. But, as the solar light increased, the absorption rose until it exceeded the radiation, and thus by contact with the increased brilliancy of the other part of the spectrum those bands appeared dark. Many other flames were then employed artificially to produce different Fraunhofer lines, and the mystery of their existence was cleared up. This discovery immediately opened up a wide field in astronomical investigation. The presence of the D lines proves that sodium exists in the vapour surrounding the sun, while the other lines also point to the presence of definite substances, such as iron, copper, nickel, etc., in a state of vapour. The same process of examination applied to the light from different stars has given us enormously increased knowledge of their composition. Fig. 4 shows diagrammatically the spectrum of Alpha Lyrae, and in Fig. 5 that of Sirius is compared with iron lines.

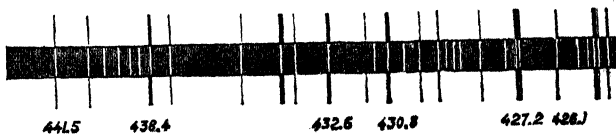


FIG. 5.—SPECTRUM OF SIRIUS COMPARED WITH IRON LINES.

Spectrum Analysis. [SPECTRUM.]

Specular Iron Ore, a crystallised variety of hæmatite or ferric oxide (Fe_2O_3), occurring in hard brilliant crystals belonging to the Hexagonal system. The locality where the finest specimens occur is the island of Elba, while crystals are also found in certain South American ore deposits.

Speculum Metal, an alloy consisting usually of about 32 parts of copper to 15 of tin, sometimes containing small quantities of lead, antimony, or arsenic. It is specially used for making the mirrors of reflecting telescopes, since it is capable of taking a high polish.

Spedding, JAMES, philosophical writer, was born at Mirehouse, Cumberland, England, on June 26th, 1808. He was educated at the Grammar School of Bury St. Edmunds and Trinity College, Cambridge, where he made several friendships that lasted throughout his lifetime. Alfred Tennyson said, "He was the Pope among us young men—the wisest man I know." From 1835 to 1841 he was engaged at the Colonial Office. He now took up the work upon which his reputation rests—his monumental edition of Bacon. His collaborators were Robert Leslie Ellis and D. D. Heath; but the former's health gave way and the latter confined himself to the legal writings, so that the lion's share of the editing fell to Spedding and he was solely responsible for the biographical portion. The *Works* appeared in seven volumes from 1857 to 1859, while the seven volumes of the *Life and Letters* were published between 1861 and 1874. Of the latter Thomas Carlyle wrote to Edward FitzGerald, in 1874, as "the hugest and faithfulest bit of literary navy work I have ever

met with in this generation. . . . There is a grim strength in Spedding, quietly, very quietly, invincible, which I did not quite know of before this book." He interrupted his labours to act as secretary to Lord Ashburton's mission to the United States in 1842 and to the Civil Service Commission in 1855. He found his work in editing and elucidating Bacon so absorbing that the offer of the permanent Colonial Under-Secretaryship at £2,000 a year proved no temptation either to moderate or abandon his task. He was run over by a cab in London on March 1st, 1881, and died on the 9th of the month. The most unassuming of men, he was the literary adviser of the most distinguished of his contemporaries. His judgment was shrewd and penetrating, and his discussion of the shares in *Henry VIII.* to be allotted to Shakespeare and John Fletcher, reprinted in 1874 by the New Shakespeare Society, has been generally accepted.

Speedwell, the popular name for the pretty species of the scrophulariaceous genus *Veronica*. It includes undershrubs, several of which are grown in greenhouses; but the British species, 15 or 16 in number, are all herbs. Their leaves are generally opposite, and the flowers are in spikes or racemes. They are monosymmetric, the calyx being apparently four-lobed from the fusion of two sepals, and the corolla similarly apparently tetramerous and sub-rotate. The flowers are blue, white or purple. There are only two stamens, an exceptional characteristic, and the two carpels form a flattened capsule. It has received various popular names, such as Angel's Eyes, Bird's Eye, God's Eye and Eyebright. *V. Chamædrys*, the germander speedwell, is one of the beauties of the hedge-rows in spring; and *V. spicata* and others are common in many English gardens.

Speier. [SPIRES.]

Speiss (German, *Speise*), an artificial compound of nickel and arsenic which is obtained by the fusion in presence of arsenic of slags and other compounds containing nickel. This is then very largely used, in conjunction with the natural ores of nickel, as one of the most important sources of the metal.

Speke, JOHN HANNING, African explorer, was born at Jordans, near Ilminster, in Somersetshire, on May 4th, 1827. Educated for the army, he



CAPTAIN HANNING SPEKE.

(Photo : Lyd Sawyer.)

joined the 46th Bengal Native Infantry in 1844, and served throughout the Sikh campaign under Sir Hugh, afterwards Lord, Gough. He was promoted captain in 1852. A zealous explorer and hunter of big game in the Himalaya and Tibet, he turned

his attention to Africa and, in 1854, joined Sir then Lieutenant, Richard Burton's expedition Somaliland. Being dangerously wounded, he was invalided to England in 1855, and, on his recovery served with the Turks in the Crimean War. In 1858 Burton invited him to take part in his Central African Expedition, and in 1858 he was exploring around Lake Tanganyika. While Burton was resting from a fever attack, Speke was permitted to investigate a larger lake to the north. This sheet of water, reached on July 30th and, four days later, obtained a complete view of it and named it Victoria Nyanza. Relations between the travellers having meanwhile grown very strained and Burton being still *hors de combat* at Zanzibar, Speke hastened to England in 1859 and proclaimed his discovery of the source of the Nile. In 1860 along with Captain James Augustus Grant (1827-92) he conducted another expedition to Equatorial Africa, in order to verify his discoveries on behalf of the Royal Geographical Society. In the result it was demonstrated that Lake Victoria was undoubtedly the main head-water of the Nile. Grant had been left at Karagwe to recuperate, and Speke pursued some of the exploration work by himself. Spending a considerable time with Mtesa, king of Uganda he afterwards proceeded down the Nile and met Sir Samuel Baker at Gondokoro. On his return to England, in 1863, Speke was welcomed warmly and received the Founders' Medal of the Royal Geographical Society. In the same year he published his *Journal of the Discovery of the Source of the Nile*. A public debate of disputed matters had been arranged between him and Burton at the meeting of the British Association in Bath, when on the very morning of the appointed day, September 18th, 1864, Speke accidentally shot himself while partridge-shooting. The injury proved mortal, and he was buried at Dowlish Wake on September 26th.

Spelling, the act of forming a word by naming, writing or printing the letters composing it in the correct order. English seems to be the only language that presents the great anomaly of possessing a spelling that in many cases affords no clue to the sound of the word represented. Accordingly many have advocated the introduction of phonetic spelling, in which the sound of the word should be exactly represented, pointing out that this system is to some extent adopted in shorthand. To the proposal it is objected, (1) that no logical system of phonetic spelling has yet been adopted, and (2) that such spelling would often destroy the history of a word. Against this it is urged that sound is the best clue to derivation, and that the present system obscures, rather than reveals, derivation. On the whole, it seems a question of æsthetic. Phonetic spelling has an uncouth appearance. A long ago as 1844 and at frequent intervals thereafter Sir Isaac Pitman (1813-97) and Alexander John Ellis (1814-90) made strenuous efforts to induce the English-speaking peoples to adopt the phonetic system. In 1906 the American Spelling Reform Association, which had the support of President Roosevelt, went so far as to issue a provisional list of the words which were, in future

to be spelled on the new and improved basis. The list was received with much good-humoured banter, formed excellent "copy" for newspaper leaders, and then was quietly left to perish of the derision it had excited.

Spelter, a commercial name applied to the metal zinc. Walter W. Skeat surmises it to be an older form of the word "pewter," and therefore as old as the 14th century at least.

Spence, JAMES, surgeon, was born in Edinburgh on March 31st, 1812, and educated at Galashiels and the Royal High School, Edinburgh. In spite of serious difficulties he succeeded in studying medicine at the University of his native city, where, after two voyages to Calcutta as a ship's surgeon, he settled, about 1835, as demonstrator in anatomy under Professor Alexander Monro III. In 1842 he became one of the teachers of regional anatomy and dissection in the extramural School of Anatomy, and after 1849, when he was elected F.R.C.S., lectured on surgery in the institution adjoining the old Royal Infirmary and later in Surgeons' Hall. In 1864 he succeeded Professor James Miller in the chair of Surgery in Edinburgh University, and died in Edinburgh on June 6th, 1882. He sustained ably the traditional fame of the Edinburgh school of operating surgeons, his perfect knowledge of anatomy enabling him to dissect with remarkable dexterity. Although a conservative operator, he was exceptionally skilful in his treatment of amputation, tracheotomy, herniotomy, and urinary diseases. His *Lectures on Surgery* (1868-71) embodied the ripest fruits of his practice and experience.

Spence, JOSEPH, anecdotist, was born at Kingsclere, Hampshire, England, on April 25th, 1699. He was educated at Eton, Winchester, Magdalen Hall and New College, Oxford. He took holy orders, and in 1726 published *An Essay on Pope's "Odyssey,"* which procured him not only the friendship of Pope, but also the Oxford Professorship of Poetry, to which he was elected, in succession to Thomas Warton, in 1728, being re-elected for a further period of five years in 1733. In consequence of his high character and amiable disposition, he was in request as a bear-leader to young men of rank on their Continental tours. He thus accompanied, besides others, the youths who later became the 2nd Duke of Dorset and the 2nd Duke of Newcastle-under-Lyme. In 1742 he was presented to the living of Great Horwood, in Buckinghamshire, and was also appointed Regius Professor of Modern History at Oxford. He died at Byfleet, in Surrey, on August 20th, 1768. In 1747 he published a treatise on classical mythology under the title of *Polymetis; or, An Enquiry concerning the Agreement between the Works of the Roman Poets and the Remains of Ancient Artists*, but his acquaintance with the leading men and women of his time resulted in his collection of *Anecdotes*, a compilation which has proved very useful to literary students and has preserved his name. Though copies of this collection circulated in manuscript—Dr. Johnson, Malone, Warburton, Warton and Owen Ruffhead were privileged to see

it in this condition—it was not published (from quite too scrupulous motives) till 1820, when rival editions appeared on the same day.

Spencer, THE EARLS OF, a noble family founded by John Spencer, third son of the 3rd Earl of Sunderland (1674-1722), statesman and bibliophile, whose library of 17,000 volumes at Althorp was described in 1703 as "the finest in Europe," by Anne, daughter and co-heiress of John Churchill, the great Duke of Marlborough. Her father's favourite, she is credited with the conversion of her mother, the Duchess Sarah, to Whiggism, and her early death, at the age of 'twenty-eight, caused general regret. Her third son, John, born on May 13th, 1708, inherited much of his grandmother's wealth; and on his death, on June 20th, 1746, he was succeeded by his only son, JOHN SPENCER, who was born on September 18th, 1734, created Earl Spencer on November 1st, 1765, and died in 1789. Of his three children, Georgina is remembered as the beautiful Duchess of Devonshire, and his only son, GEORGE JOHN, born on September 1st, 1758, became by courtesy Viscount Althorp. After two years of foreign travel he entered the House of Commons in 1780 and succeeded, as 2nd Earl, on October 23rd, 1783. In 1794 he was appointed First Lord of the Admiralty, and during the six memorable years he held this post he became known as the Organiser of Victory; Cape St. Vincent and Camperdown were fought and won, and to him belongs the distinction of having selected Nelson for an independent command which resulted in the victory of the Nile. When William Pitt resigned, in February, 1801, Spencer also retired, but resumed office as Home Secretary under Fox in the Ministry of All the Talents, 1806-7, retiring when the Duke of Portland became Premier, and he then devoted himself to administrative work in his own county of Northamptonshire. President of the Royal Institution and a Trustee of the British Museum, in 1812 he was one of the founders and first President of the Roxburghe Club. During his later years he occupied himself with the rehabilitation of his famous library. He married, in 1781, Lavinia, daughter of the Earl of Lucan, who was remarkable alike for her beauty and intelligence and for several years was considered the leader of London Society. She died in June, 1831; and when her husband died, on November 10th, 1834, he was succeeded, as 3rd Earl, by his son, JOHN CHARLES, born on May 30th, 1782, best known by his courtesy title as Lord Althorp. Taught to read by his mother's Swiss footman, he was sent at the age of eight to Harrow, and in 1800 went up to Trinity College, Cambridge, against his own wish, he wanting to enter the Navy. Hunting and racing occupied much of his time, but he acquired habits of industry and exactness, studied mathematics, and graduated M.A. in 1802. He entered Parliament as member for Okehampton in April, 1804, and in 1806, in compliment to his father, then Home Secretary, was appointed a Lord of the Treasury in the Grenville-Fox ministry. With relays of horses he would gallop all night after a sitting of the House, that he might hunt with the

Pytchley in the morning, and his devotion to sport was equalled by his admiration for prize-fights. At the general election in November, 1806, he was returned for Northamptonshire, which he represented until he succeeded to the peerage, but his maiden speech was not made until 1809. Indignation at the Duke of York's conduct at the Horse Guards and his Royal Highness's complicity in scandalous sales of commissions led to his moving the resolution by which the Duke was brought to resign, and when, in 1812, the Government reappointed the Duke Commander-in-Chief he supported a vote of censure. He rarely attended the debates, partly from disinclination, realising the futility of opposing the powerful Tory ministry. On April 14th, 1814, he married Esther Acklom, of Wiseton Hall, Northamptonshire, to whom he was deeply attached, and after her death in childbirth, on June 11th, 1818, he always wore mourning. He lived in retirement for some years, but was constrained to re-enter public life. After the dissolution of the Wellington Cabinet, at the general election of 1830 Althorp was returned unopposed. The Whigs resolved to support Parliamentary reform, and, having rejected Lord Grey's proposal that Althorp should form a ministry, he agreed to join with Grey, becoming leader of the House of Commons and Chancellor of the Exchequer. His party soon recognised that this unambitious, almost tongue-tied man had rare qualities, and he was esteemed "the best leader that any party ever had." On March 1st, 1831, the Reform Bill was introduced by Lord John Russell. The alterations proposed exceeded anticipation and were received with derision. A majority of one carried the second reading, and after the Government had been twice defeated in committee they resolved to appeal to the country, though Parliament was but a few months old. The election gave the party an increased majority. When, after some weeks of incessant strain, Lord John was exhausted, it fell to Althorp to take charge of the Bill. Constant speaking improved his powers of debate, and when, in spite of long-drawn-out, eager opposition, the Bill passed, Sir Henry Hardinge fairly expressed the personal triumph of its champion, "It was Althorp carried the Bill; his fine temper did it." His personal influence proved irresistible in a sphere which was ever repugnant to him. Lord Grey unsuccessfully endeavoured to induce him to accept a peerage that he might continue in charge of the measure in the House of Lords; and when Lord Lyndhurst, in the Upper Chamber, carried a motion postponing the consideration of the disfranchisement clauses, the ministers resigned on May 7th, 1832, but, being returned to office, the Bill was allowed to pass on June 4th. Party differences eventually weakened the Whigs, and difficulties over an Irish Coercion Bill led to Althorp's resignation. He was indispensable to Lord Grey; and on Grey's own resignation, on July 9th, 1834, Lord Melbourne became Prime Minister. Althorp's retirement was deprecated by his party, and he resumed office until, on his father's death, he became a peer. Melbourne vainly entreated him to hold an office without duties; but the life, he said, was misery to him, and he decided to follow the

country pursuits he loved, and to disencumber his estates, which were heavily mortgaged. Rare did he emerge from his retirement. He defended his colleagues in the House of Lords after their fall in 1841, and spoke at Northampton, in 1843, in favour of the repeal of the Corn Laws. "Protection," he said, "was unnecessary and reciprocity fallacy." His services to agriculture were considerable. In 1825 he became President of the Smithfield Club, at the annual dinner of which, on December 11th, 1837, he first made the suggestion which led to the formation of the Royal Agricultural Society of England. Trusted by his friends and by his opponents, his absolute truthfulness and honourable dealing entitle him, who was named "honest Lord Althorp," to a distinguished place among English political leaders. He died on October 1st, 1845, and was succeeded by his brother, FREDERICK, 4th Earl, born April 14th, 1798, who married Elizabeth Georgiana, second daughter and co-heiress of William Stephen Poyntz, M.P., of Cowdray Park, Sussex. JOHN POYNTZ SPENCE was born on October 27th, 1835, succeeding as 5th Earl on his father's death on December 27th, 1857. Educated at Harrow and at Trinity College, Cambridge, where he graduated in 1857, for a few months he represented South Northamptonshire in the House of Commons. In December, 1868, the "Reform Bill," as he came to be styled from his magnificent beard, was appointed Lord-Lieutenant of Ireland, retaining that office until W. E. Gladstone's resignation in February, 1874. In 1880 he became Lord President of the Council, and, on the resignation of Earl Cowper, was again nominated Lord-Lieutenant of Ireland on May 6th, 1882, on the evening of the day when Lord Frederick Cavendish and Mr. Burke had been assassinated close to the Viceregal Lodge in Phoenix Park, Dublin. Here he remained until the close of the Gladstone Administration in June, 1885. On Gladstone's return to office in February, 1886, he was again Lord President, having assented to the Home Rule policy, his experiences at Dublin Castle having convinced him that coercion had failed in its objects. His support was of great service to the Government. From 1892 to 1896, Earl Spencer was First Lord of the Admiralty. He was married, on July 8th, 1858, to Charlotte, daughter of Frederick Charles Seymour, grandson of the first Marquess of Hertford, and her lamented death occurred on October 31st, 1903. His heir is his half-brother, Charles Robert Spencer, created Viscount Althorp in 1905, who was born on October 30th, 1857.

Spencer, DOROTHY, COUNTESS OF SUNDERLAND, known in literature as "Sacharissa," daughter of the 2nd Earl of Leicester, was born at Sion House near Isleworth, Middlesex, on October 5th, 1611. On her grandfather's death her parents removed to Penshurst, in Kent, where she was brought up with Algernon Sidney and her other brothers. Her remarkable beauty, grace and charm won several admirers, and Edmund Waller, the poet, addressing her as "Sacharissa," paid her amatory homage in verses that are still admired. She, on her part, gave him no encouragement, but married, in 1639, Henry

Lord Spencer, who was created Earl of Sunderland in June, 1643. In September of the same year he was mortally wounded at the battle of Newbury in the Civil War. After remaining nine years a widow,

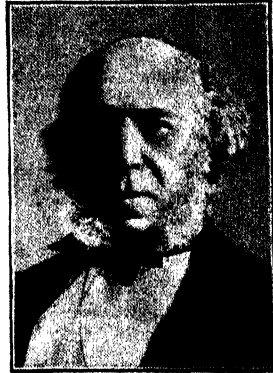


DOROTHY SPENCER, COUNTESS OF SUNDERLAND.
(After Van Dyck.)

his countess, in 1652, married Sir Robert Smythe, of Sutton-at-Hone and Boundes in Kent. She died soon after the execution of Algernon Sidney, and was buried in the chapel of the Spencers in Brington church, Northamptonshire. Van Dyck painted her portrait several times.

Spencer, HERBERT, metaphysician, was born at Derby, England, on April 27th, 1820, his father being a tutor in that town. It was from his father and his uncle, a clergyman, that he chiefly received his education. When seventeen years old he was apprenticed to a civil engineer, and followed this profession for about eight years, writing articles on various subjects connected with it for an engineering journal. His first work of a general character was a series of letters on *The Proper Sphere of Government*, published in 1842. Coming to London, he became sub-editor of *The Economist*, and while holding that post (1848-53) published *Social Statics* (1850), parts of which he afterwards formally withdrew. Meanwhile he wrote very frequently for the reviews, and in 1855 brought out his important *Principles of Psychology*, which partly anticipated the Darwinian doctrine. In this work he laid it down that all phenomena could be explained by the evolution law, and in 1860 issued the synopsis of his *System of Synthetic Philosophy*, which attracted great attention in all parts of the British Empire and throughout Europe and gave him a prominent place among modern philosophers. In 1861 appeared his acute study of *Education*, which was translated into many languages, and this was followed by his *Essays, Scientific, Political,*

and Speculative (1858-63), *The Classification of the Sciences* (1864), and *The Study of Sociology* (1873). He was engaged during this period on the realisation of his great system of philosophy, and had published the following portions of his plan: *First Principles* (1862), *The Principles of Biology* (1864), and *The Principles of Psychology* (1872). At later dates he brought out further instalments, such as *The Principles of Sociology* (1876), *Ceremonial Institutions* (1879), *Political Institutions* (1882), *Ecclesiastical Institutions* (1885), *The Data of Ethics* (1879), *The Factors of Organic Evolution* (1886), *The Principles of Ethics* (1892), *The Principles of Sociology* (finished 1896). With this last book he finally completed, amid universal congratulation, the great work he had set himself to perform, in spite of almost continuous ill-health. His works were widely translated, and their author was offered many academic honours, which he always declined. He died at Brighton on December 8th, 1903. His *Autobiography* was published in 1904.



HERBERT SPENCER.
(Photo: Elliott & Fry.)

Spener, PHILIPP JAKOB, founder of the sect of Pietists, was born at Rappoltsweller, in Alsace, on January 13th, 1635. After leaving Strasburg University, he visited the Universities of Basel, Tübingen and Geneva, at the last-named city developing views that afterwards carried him to Pietism. On his return to Strasburg, in 1663, he was appointed preacher without charge, with the right of lecturing in the University. In 1666 he was invited to the pastorate of the Lutheran church at Frankfort-on-the-Main, and in 1670 began the series of meetings of a religious character to which he gave the name of *Collegia Pietaria*, and from this the name of Pietist arose. In 1686 he removed to Dresden, where he was made Court preacher, and in 1691 was made rector of St. Nicolas' in Berlin, but Halle—where, in 1691, he founded and directed the University—became the real centre of the Pietistic movement. His earnestness and knowledge obtained for him almost universal respect, and he wrote many theological works, and was the first person to introduce the study of heraldry into Germany. He died at Berlin on February 6th, 1705.

Spennymoor, a town of Durham, England, 6 miles S. of Durham city. In consequence of the development of collieries and iron foundries it has advanced with remarkable rapidity. The principal

buildings include St. Paul's Church (erected in 1857), the town hall, market halls, Memorial Hall, Mechanics' Institute and Masonic Hall. Victoria Park, a small but nicely laid out pleasure ground, was opened in 1889 to commemorate the Queen's Jubilee. Pop. (1901), 16,665.

Spenser, EDMUND, poet, was born in 1552 in Smithfield, London. Of his family little is known, except that it was of Lancashire stock



EDMUND SPENSER.

(By permission of the Rev. S. Baring-Gould.)

and claimed relationship with the Spencers of Althorp. He was educated at the Merchant Taylors' School, and in 1569 he made his first appearance as a poet with some translations from Du Bellay and Petrarch, which were published in Van der Noodt's *Theatre for Worldlings*. In the same year he was admitted as a sizar to Pembroke Hall, Cambridge. He took the degree of B.A. in 1572 and M.A. in 1576. Of his career at college we hear nothing, except that his health was delicate, and that he became a close friend of one of the fellows of Pembroke, Gabriel Harvey, the "Hobbinol" of his pastoral poems, who attempted to bring him into a movement for the introduction of unrhymed classical metres into English verse. On leaving Cambridge Spenser lived for a while in the north of England, perhaps in Lancashire, where (as we have seen) he probably had relations. About this time he fell in love, seriously and unhappily, with a young lady, whose name is only known in his anagram, "Rosalind." On his return to the south he was introduced by Harvey to Sir Philip Sidney, who, in turn, presented him to Queen Elizabeth, and ever afterwards exercised a strong influence over him, leading him, perhaps, into affectations of language and metre, but showing him a living example of his ideal knight and courtier. In 1579 Spenser first proved his power by the publication of *The Shepheard's Calender*, a pastoral poem, or set of "Æglogues" (eclogues) following the classical models. The book was not printed in the author's name, but introduced as the work of a "New Poete" in a preface by his college friend Edward Kirke. In 1580, in the capacity of secretary he accompanied the Lord Deputy, Lord Grey of Wilton, to Ireland, a country which was thenceforward to be his home, and which, with its scenes of revolt and violence, must have been full of suggestions for the

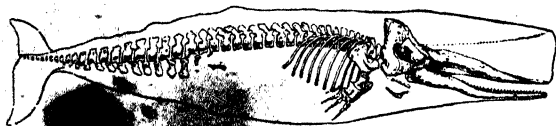
poet of the *Faerie Queene*, a specimen of which had already been submitted to Harvey, who greatly preferred the *Nine Comedies*, which Spenser had also sent to him, and which, with his *Stemmata Dudleiana* and other poems, are now lost. In Lord Grey Spenser had a chief whom he thoroughly admired, and whom he introduced into the *Faerie Queene* as Arthegal, the personification of justice. His own policy, based, like Lord Grey's, on ruthless military repression, was developed in his *View of the Present State of Ireland*, which, though not published in his lifetime, was entered at Stationers' Hall in 1598. It was issued in 1633 and is written throughout with savage unsympathy. With Spenser there was no remedy for Irish wrongs and grievances. England's laws must alone be observed and enforced and Irish nationality was to be extirpated. The flaming discontent which burst forth into rebellion in the following year was the only answer Ireland could give. His promotion under Government was neither great nor rapid. In 1581 he was made Clerk of Decrees and Recognisances in the Irish Court of Chancery, and received a lease of the lands and abbey of Enniscorthy. In 1588 he was appointed clerk to the Council of Munster, and, two years before, had had assigned to him the castle of Kilcolman in the county of Cork. At the end of 1589 he went with Sir Walter Raleigh, now his neighbour in Ireland, to London, carrying with him the first three books of the *Faerie Queene*, which were published early in 1590. He remained in London for twelve months, and received a pension of £50 a year from the Queen. In 1591 his publisher brought out a volume of his collected pieces, *Complaints*, and *Daphnida*. He married, in 1594, a lady whose Christian name, Elizabeth, alone has come down to us, but who was probably the daughter of James Boyle, the 1st Earl of Cork, and in the next year he published his *Amoretti* and *Epithalamion* in her honour. In this year (1595) there also appeared his *Colin Clouts Come Home Again*. In 1596 he brought out three more books of the *Faerie Queene*, *Four Hymnes*, *Prothalamion* and *Astrophel*. In 1598 he was appointed Sheriff of Cork, but in the same year his house was burnt down during Tyrone's rebellion. He crossed to England, ruined, and died at Westminster on the 16th of January, 1599. He was buried in the Abbey near Chaucer, whose English he had imitated, and as whose first great successor, alike in melody and creative power, he is admitted to rank.

Spermaceti, a shining waxy solid which is obtained from the oil which occurs in certain cavities in the head of the Cachalot or Sperm Whale (*Physeter macrocephalus*). The oil is found chiefly in a cavity situated in the upper jaw, and is usually removed by an aperture cut just alongside the nose, being obtained in very large quantities. On standing and cooling the oil (sperm oil) deposits crystals of the

spermaceti, which are purified by pressure and recrystallisation. Chemically, the substance consists principally of cetyl palmitate ($C_{52}H_{104}O_2$), and, if pure, forms waxy flakes or needles which melt at 49° . The oil is of a yellow colour, with a slight odour, and is used for illumination and for soap-making. Spermaceti is not now much used medicinally, but an ointment is prepared from it, with Chinese wax and alcohol.

Spermaphyta. [PHANEROGAMIA.]

Sperm Whale, or CACHALOT (*Physeter macrocephalus*), the sole species of a genus of Toothed Whales, from tropical and sub-tropical seas, where they occur in large schools led by old males. The length of the male, when fully grown, is about 60 feet, of which the enormous square head counts for at least one-third; the females are much smaller. The colour is black above, lighter on the sides, and silvery-grey beneath. There are no teeth in the upper jaw, and those in the lower jaw fit into hollows



Sperm Whale Skeleton and Outline of Animal.

above. They feed principally upon cuttle-fish and squids, and are hunted for their oil, spermaceti and ambergris. Though at one time tolerably common in the Pacific, Indian and Atlantic Oceans, persistent hunting has thinned their numbers, but their scarcity in the Atlantic is no doubt to a considerable extent due to the notable increase of traffic in that ocean. The Sperm Whale is readily recognised, even at a distance, by the regularity of its blowing and the discharge of what looks like a volume of vapour obliquely forwards. It ploughs its way through the sea at a steady four or five miles an hour. The males keep to the surface for some fifteen minutes and then go under for an hour or more, females and young ones remaining up and descending at more frequent intervals. At times, instead of swimming quietly on the surface the creature progresses more rapidly by a sort of lurching movement, the head thrust well above the water, and a mass of spray, technically called "white water," accompanying it. Now and then they leap headlong out of the sea ("breaching") and at times violently lash the surface with their tails ("lobtailing"). Occasionally blindness overtakes them and the lower jaw is sometimes twisted like a shepherd's crook. Besides man, the Thresher Shark and Killer Whale, or Orca, are its chief enemies.

Spey, a river of Scotland, rising in Loch Spey (1,142 feet above the sea) and pursuing at

first an easterly and afterwards a north-easterly course to the Moray Firth into which it discharges after a total run of 107 miles. It is the most rapid river in Scotland, and in length and volume of water is inferior only to the Tay. It has a drainage basin of 1,300 square miles and, next to the Tay and Tweed, is the finest of Scottish salmon rivers.

Spezia, or SPEZZIA, a port of the province of Genoa, Italy, situated on the gulf of the same name, 50 miles S.E. of Genoa. It is the greatest naval arsenal of the kingdom, and contains yards for the construction of ships of war, a department for the fabrication of artillery and another devoted to the manufacture of submarines and electrical apparatus. The railway across the Apennines places the port in direct communication with the industries and agriculture of the plain of Lombardy and led to a marked development of commerce. The harbour was enlarged and new basins added, while the quayage was extended. The notion of establishing a vast arsenal here is said to have originated with Napoleon. The gulf has always been noted for its picturesque scenery. It was whilst returning to Lerici, on its eastern shore, that Percy Bysshe Shelley made the voyage in which he lost his life, and at Portovenere, on the western side, is Byron's Grotto, so named from a local tradition associating it with *The Corsair*, though this seems doubtful. Charles James Lever (1806-72), the novelist, was British consul at Spezia from 1857 to 1867. Pop. (1901), 65,612.

Sphagnum. [Bog-Moss.]

Sphenodon, or TUATERA (*Hatteria punctata*), a New Zealand lizard, the sole living representative of the order Rhynchocephalia, but rapidly becoming extinct. It was first mentioned in the diary of William Anderson, Captain Cook's surgeon and naturalist. It lived in holes and the sandhills near the shore. Consumed by the natives and apparently also by pigs, its numbers, once considerable, were rapidly reduced. Its food is insects and small ground birds. In form it is not unlike an iguana; the upper surface is olive-green with yellow spots, the under surface is whitish. The greatest length is about two feet, but those brought to Europe are smaller. The skeleton is in some respects fish-like, and in others crocodilian. The chief interest of the animal lies in the fact that it was the subject of W. B. Spencer's investigation of the median eye, which Von Graaf had found in the slowworm. Further investigations seem to point to the conclusion that the pineal body of the brain is in reality a vestige of an impaired median eye that looked upwards. Similar eye-like structures have been found in other lizards and in some fishes. (Spencer's Papers on the subject will be found in *Proc. Roy. Soc.* 1886, p. 559, and *Quar. Jour. Micros. Science*, xxvii., 166.)

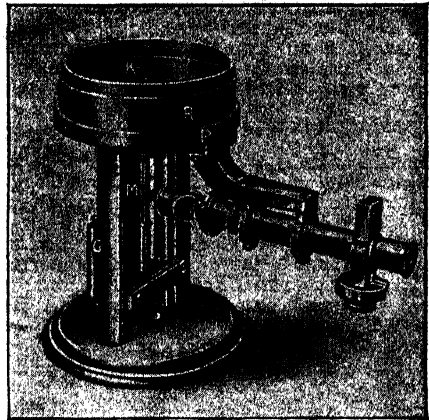
Sphenoid Bone. [SKULL.]

Sphere, the most regular and most symmetrical of solid figures. It is produced by the revolution of a semicircle about its diameter, and every point on its surface is equidistant from its centre. Every plane cuts the sphere in a circle; if the plane passes through the centre, the circle is called a great circle, other circles being called small circles. All great circles are equal. Two spheres always intersect in a circle, whose plane is perpendicular to the line joining the centre of the spheres. The surface of a sphere is equal to $4\pi r^2$, where r is its radius, and is equal to $\frac{1}{4}$ the total surface of the circumscribing cylinder. This cylinder is one whose length and the diameter of whose ends are equal to the diameter of the sphere. Its centre therefore coincides with the centre of the sphere, and the latter is just contained in it. If we regard only the curved surface of the cylinder and not the ends, we note that the surface of sphere and cylinder are equal; also, if we take a section of the sphere parallel to the base of the cylinder, the curved surface of the portion of the sphere so cut off is equal to that of the cylinder. But the area of the curved surface of the cylinder equals the circumference of its base (which is the same as that of a great circle of the sphere) multiplied by its height; hence this is the area of the section of the sphere's surface. Extending this slightly, we see that if a sphere be cut by two parallel planes, the area of the curved surface so obtained is equal to the distance between two planes multiplied by the circumference of a great circle. The volume of a sphere is $\frac{4}{3}\pi r^3$, or $\frac{1}{4}$ the volume of the circumscribing cylinder.

Spheroid is a limiting case of the ellipsoid when the sections in one direction are circles instead of ellipses. It can be obtained by the revolution of an ellipse about one of its axes. If the major axis be taken as the axis of revolution, a prolate spheroid is obtained, while revolutions about the minor axis give an oblate spheroid. The earth is an example of the latter. As major and minor axes approach each other more and more in length, the two ellipsoids also become more alike, the limiting case being the sphere. [ELLIPSOID; QUADRIC SURFACE.]

Spherometer, an instrument for measuring the radius of a circle. It consists of a circular disc of metal with a graduated edge. This rests upon three equal equidistant legs whose points are hard and rounded. A screw is fixed to the centre of the disc, and its end is also hard and rounded: this constitutes a central or fourth foot. When the spherometer rests upon a plane—say, a smooth sheet of brass—it is perfectly steady on its three feet; but the disc may be turned till the fourth foot also meets the brass. At one point all four feet are in a plane, but another fraction of a turn brings the fourth foot too far down, and the whole instrument rocks. The point when rocking is just about

to begin is the point when the fourth foot is exactly level with the other three. If the instrument be now transferred to a lens, the central foot must be screwed up to let the three feet take



SPHEROMETER. (Photo supplied by Carl Zeiss.)

(K) Contact-pin. (R) Metal ring, supplied in different diameters to support the lens, the radius of which is to be measured. (U) Table on which metal rings (R) are placed, so that the contact pin (K) is always in centre of ring. (M) Scale, divided into 1/100 of millimeter, which is to be read off by means of microscope with micrometer motion, as shown in illustration. (G) Counters pole for contact pin (K).

steady position, and then screwed down till rocking is again just about to begin. The distance through which the foot has been moved since it was on the flat plate is read off on a fixed upright scale, and fractions of a revolution are obtained by observing the position of the graduated disc. The curvature of the lens can then be quite simply deduced.

Sphincter Muscle, a muscle which regulates the closure of an orifice in the animal body e.g., the sphincter of the urinary bladder and the sphincter ani.

Sphinx (Greek, "The Strangler.") is met with in Egyptian and in Greek mythology, though it is doubtful if there is more than an accidental connection between the two. The Greek Sphinx has the body of a lion, the face and bust of a woman, and is winged. The story goes that the Sphinx haunted Boeotia and tormented people with the conundrum "What goes on four legs in the morning, two at noon, three at night and is weakest when it has most feet?" All who were unable correctly to expound the riddle were promptly slain. (Edipus solved it, thereby bringing woe upon himself, and the Sphinx, having no further object in life, drowned herself. The answer was, "Man, who creeps in infancy [four legs in the morning of life], walks erect afterward and finally hobbles along by the aid of a staff [three legs in the evening of life].") The Egyptian Sphinx is not winged, has a human head, male or female, surmounted by a Egyptian head-dress, or an animal head

(usually a ram's or a hawk's) and a lion's body. Its Egyptian name is equivalent to



EGYPTIAN SPHINX.
(From the Serapeum.)

"lord" or "master." These figures were often erected at the entries of temples. The well-known Sphinx at Gizeh is 150 feet long and 63 feet high. The Louvre possesses one of red granite 22 feet long.

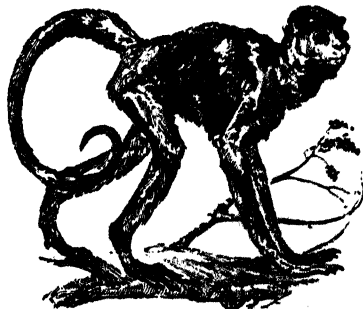
Sphinx, a genus of moths which is the type of the family Sphingidae and the section of Sphinges. The typical species of the genus is *Sphinx ligustri* (Linn.) or the Common Privet Hawk Moth, so named from the larva feeding on the privet, lilac and other trees. It measures four inches across the wings, which are pale brown, varied with darker brown and black; the hind wings are pale pink, crossed by three black bands. The green caterpillar, with white and lilac streaks on the back, when at rest assumed an attitude which suggested to the older naturalists that of the mythological Sphinx, and so the insect was named. *Sphinx snelleni* is a fossil species from the Solnhofen Slate in the Jurassic system in Bavaria.

Sphygmograph. [PULSE.]

Spice Islands. [MOLUCCAS.]

Sponges, small and typically needle-shaped structures which form the elements of the skeleton in many invertebrates. They are composed of different materials, such as carbonate of lime in the Gorgonias, silica in the silicious sponges, or chitinous or fibrous material, as in freshwater sponges. They occur in many different groups, including the sponges, echinoderms, alcyonarians, corals, tunicates, and bryozoa. They may be united together to form regular lattice-like skeletons, as in the Hexactinellid Sponges, or into dense masses with the spicular structure obliterated, as in *Corallium* (the Red Coral), or may be loosely scattered through the soft fibres, as in the outer crust of Gorgonias and in horny sponges.

Spider-Monkey, a popular name for the species of the genus *Ateles*, New World monkeys from Central and South America. Because of their length of limb, slender bodies, long hair and long tail, by which they suspend themselves from branches of trees, and their extremely variable movements, they were called Spider-Monkeys by early European observers. They may be seen in the forests of Brasil, hanging in clusters, clasping one another by their limbs and tails, the whole being supported by the stalwart tail of one strong fellow. They employ their tail as if it were a fifth limb. It is a marvellous organ for swinging and clasping with, and exquisitely sensitive at and near the tip, stout where it joins the body and exceedingly muscular. They have small round heads, the muzzle only projecting slightly and thus giving them, especially when their large eyes are open and the hair on their cheeks and brows is brushed forwards, a strangely human appearance. Some are covered with soft fur, others with coarse, long, rigid hair. In all the thumbs of the hands are either absent or present only as stunted projections, though in both cases the member is not wholly deficient so far as its bones are concerned. The long feet have well-shaped toe-thumbs. Their hind limbs, shorter than the fore, though useful when they are amongst the branches, are feeble on the ground. There the monkey walks on the outside edge of the feet and the inside edge of the hands, the tail constantly on the move, feeling here and there for anything to seize hold of. They are often sedate and slow in their movements, gentle in disposition and very playful. Occasionally they assume an erect posture for a short time, being practically the only New World monkeys who can adopt it. They eat fruit and vegetables, and enjoy eggs and nuts, although possessing no cheek-pouches. Their manner of resting is interesting. The

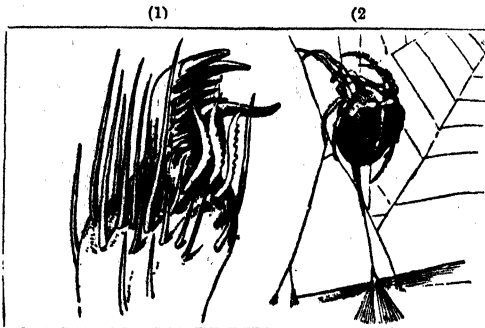


SPIDER-MONKEY.

great apes of the Old World lie on their backs like a man, while monkeys with callosities sit on them, and, drawing up the knees, let the head fall on to them or on to the breast and bring forwards

the arms when they sleep. The Spider-Monkeys lack callosities and the peculiar flatness of back of the anthropoid apes. Therefore some lie on their sides, others huddle together in companies, while others lie face downwards across two or three horizontal boughs, round which the tail is twisted for additional security.

Spiders, the members of the group of Arachnida known as the Araneidæ. They are characterised by having a soft, unsegmented abdomen, a pair of powerful jaws or feelers, perforated by the ducts from a poison gland, and by the possession of two or three pairs of spinnerets or spinning organs. They breathe by means of one or two pairs of lung sacs. The character which is most conspicuous on casual examination is that the two front segments of the three into which the bodies of the Arachnida are typically divided, are fused together into a single mass or cephalothorax;



(1) FOOT OF SPIDER.
(2) ANCHORAGE OF WEB.

the abdomen is connected with this by a short, narrow stalk or peduncle. The spiders are mainly terrestrial, and therefore breathe air; this passes through small openings known as stigmata on the lower surface of the body. The stigmata are usually two in number, but four are not uncommon (e.g., in the Mygalidæ), while in others there may be one or more additional ones in front of the spinnerets. The stigmata lead either into lung sacs or into branching tubes known as tracheæ. The first pair of stigmata always open to lung sacs; the second pair either to lung sacs or tracheæ; and the additional posterior stigmata are always connected with tracheæ. Some spiders are aquatic, but, nevertheless, they breathe air which they carry down to their nests in bubbles attached to the hairy portions of their body. The eyes are always simple; the number varies from one pair to four pairs; they are arranged in a group or in lines on the top of the front portion of the cephalothorax. As would be inferred from their possession of powerful piercing jaws and poison glands, the spiders are carnivorous in habit. The method

by which they catch their prey is the feature of most general interest in this group. In the hinder part of the abdomen there are many small glands which secrete a viscid fluid, which, on exposure to air, hardens into a thread. The glands communicate by ducts with pores on the summits of four or six small tubercles known as spinnerets; the secretion is forced through these, and comes out as a fine thread. This is used either (1) to attach the eggs to the body of the parent, or (2) to form nests or cocoons in which the eggs are stored, or (3) usually for the spinning of a web in which the food of the spider is entangled. The form of the web is very varied; in the common garden spiders it consists of radial spokes connected by cross threads, and is generally circular in shape; in others it is a thin, irregular sheet; in others, common on grass, it consists of a thin tube often placed in the centre of a funnel-shaped sheet; and in others it is a buried tube, the mouth of which is closed by a door, as in the Trap-Door Spiders. In some of the larger spiders no web is made, but the animal hunts its prey. From time to time experiments have been made with a view to ascertaining whether spider silk was of any economical value. In the 18th century Le Bon of Languedoc obtained enough silk for a pair of gloves and a pair of stockings. Nothing came of such efforts, however, beyond the production of a few curiosities. The spiders are bisexual, and the males are much smaller than the females, but usually more active. In some cases this sexual dimorphism is carried to an extreme, and the male exists only in order to fertilise the female. The female, in some of these, often devours the male either during the flirtation or as a post-nuptial settlement. Spiders are found all over the world and those permanently inhabiting caves become sightless. The oldest spiders occur in the Carboniferous rocks; a few have been found in the Jurassic, but most of the fossil species have been yielded by the amber deposits in the Oligocene of North Germany. The Sea Spiders and Harvest Spiders do not belong to the Araneidæ, and are not true spiders; the former are members of the Pycnogonida, and the latter of the Phalangida.

Spiegeleisen, a variety of cast-iron which contains a very high percentage of carbon, sometimes 5 per cent. It also always contains manganese to the extent of 5 per cent., and frequently much more. Owing to this constituent, it is much used for the production of steel by the Bessemer process, as, although but little of the manganese passes into the steel, yet it materially improves the quality of the product.

Spike, a form of inflorescence in which the peduncle is elongated, the flowers are sessile, and the order of opening is acropetal. A compound spike occurs in wheat, its small component spikes being termed spikelets. The spikelets in other grasses are variously

arranged. A simple spike occurs in the plaintains. The catkin differs mainly in being deciduous; the spadix in having a fleshy peduncle.

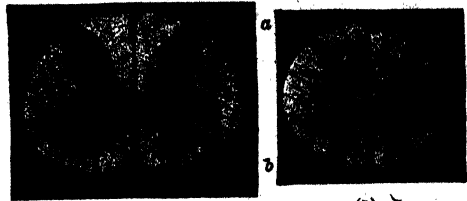
Spikenard, the aromatic bitter root of *Nardostachys Jatamansi*, a Nepalese herbaceous plant belonging to the Valerian family. It is largely used in Indian perfumery, ointments and hair-washes, and occasionally as a medicine. Its odour is heavy and described as resembling that of a mixture of patchouli and valerian. In the Gospel of St. Mark (xiv. 3) it is called "very preeious," and in ancient times was highly esteemed in the East, being used in Brahminical sacrifices, and, when fresh, was exquisitely sweet and was added to rich essences in order to enhance their scent.

Spinach (*Spinacia oleracea*), a hardy annual, probably native to Western Asia, belonging to the order Chenopodiaceæ, has been cultivated in England for more than three centuries for the sake of its large, succulent, triangular leaves, which form an esteemed vegetable. They are rich in nitre. *Tetragonia expansa*, the New Zealand Spinach, wild in Japan and in most of the Southern hemisphere, was introduced into England by Sir Joseph Banks in 1772, and is used as a summer spinach. The leaves of some small varieties of beet (*Beta vulgaris*) are also employed as a substitute, and the young tops of the stinging nettle are similar in flavour. Mountain Spinach or Orache (*Atriplex hortensis*), a native of Tartary, formerly much grown in England, is still cultivated in France.

Spinal Column, or **SPINE**, the backbone, consisting of a series of bones extending from the head to the end of the tail and placed one above, or in front of another, and called vertebræ. All animals that possess this characteristic part of the skeleton in common are therefore designated as Vertebrates and constitute the highest division of the animal kingdom. The number of vertebræ varies in different animals, but in man there are 33, disposed thus:—7 in the neck (cervical vertebræ), 12 in the back (dorsal), 5 in the loins (lumbar), 5 ossified together and forming the sacrum (which is the largest, stoutest and most solid part of the backbone), and 4, also united into one, forming the extremity of the column and called the coccyx. The first 24 are known as the true and the remainder as the false vertebræ, the distinction turning upon the fact that the flexibility of the column in virtue of which it can bend, as a whole, in any direction is due especially to the lumbar and cervical vertebræ, which are the most movable. The dorsal and coccygeal are less mobile and the sacrum is fixed. The elasticity is further increased by the bones being arranged in curves instead of perpendicularly, and the communication of shock to the brain is averted by the interposition of fibro-cartilage or gristle between each vertebra. These pads are very elastic and play the principal part in producing the curvilinear disposition of the back-

bone. Taken together they form nearly one-fourth of the complete spine and are extremely compressible, so much so that it is estimated that while an adult loses half an inch in height during the day owing to their compression, this is gradually recovered during the night by the expansion of the pads to their normal thickness. Each vertebra is also attached, by means of strong elastic ligaments, to the adjoining vertebra both in front of it and behind, the whole being thus kept in their places.

Spinal Cord. The spinal cord is a cylinder of soft nervous tissue which extends from the medulla oblongata to the first lumbar vertebra, being contained in the spinal canal of the vertebral column. It is ensheathed in membranous structures, the attachments of which serve to maintain it in position, and from its lower extremity a narrow cord, the *filum terminale*, depends. The spinal cord gives off 31 pairs of nerves [NERVE], and it is bulged in the situations from which the nerves which form the brachial and lumbar plexuses emanate; these



(A) SPINAL CORD.

(A) Transverse section through the Cervical region.
(B) " " " " Dorsal region.

a, posterior horn; b, anterior horn.

points of swelling are spoken of as the cervical and lumbar enlargements. The cord consists of two lateral halves, which are almost completely separated from one another by the anterior and posterior median fissures; the former of these is an actual cleft; the latter is constituted by a penetration into the substance of the cord of a partition formed by one of the enveloping membranes, the pia mater. The cord consists of white and grey matter, the former constituting the outer part of the cord, the latter lying internally and being disposed in a shape which has been compared to that of the letter H. The grey matter thus consists of two lateral halves united by a median band, in the centre of which is situated the central canal of the cord. That portion of the median band which lies in front of the central canal is called the anterior commissure, and that portion which lies behind it is called the posterior commissure. The extremities of each lateral arm of the grey matter are called horns, anterior and posterior respectively. (See Figures.) The anterior horn presents a rounded bulbous enlargement, from which a number of strands of nerve-fibres pass outwards at certain points and form the anterior roots of each of the

spinal nerves; many of these nerve-fibres communicate with the large ganglionic nerve-cells, which are disposed in a number of more or less definitely localised clusters in the anterior horn of the grey matter of the cord. The posterior horns are prolonged outwards in the form of strands of nerve-fibres which pass into the posterior roots of the several spinal nerves. By the emergence of nerve-fibres from the grey



SPINAL CORD.

Transverse section through the Lumbar region.

a, posterior horn.
b, anterior horn.

matter of the cord to form the roots of the spinal nerves, the white matter lying superficially to the central core of grey matter is split up into three columns, anterior, lateral, and posterior, as they are termed. Examined microscopically, the grey matter consists of nerve-cells, nerve-fibres, and a network (neuroglia); it is richly supplied with blood-vessels. The white matter contains a supporting framework of neuroglia, but is mainly composed of white medullated nerve-fibres, which are disposed longitudinally in the substance of the cord. An account of the connections which are established by these columns of white fibres and of their association with the transmission of motor impulses is given under the heading PARALYSIS. The motor impulses, after passing downwards in the "motor path" [PARALYSIS], emerge from the cord along the anterior roots of the spinal nerves. The posterior roots are largely concerned with the transmission of sensory impulses, which reach them after travelling from the periphery along the nerve trunks, and are conveyed through the posterior roots to the grey matter of the cord.

Diseases of the Spinal Cord. When disease affects the spinal cord, it is apt to be limited to certain regions, and in association with the locality involved special symptoms occur. In the disease known as infantile spinal paralysis, the ganglion cells in the anterior horns of the grey matter are particularly affected. Certain degenerations involve particular longitudinally-disposed strands of white matter; for instance, in locomotor ataxia the posterior columns of the cord are specially implicated in the degenerative process. Degeneration of parts of the lateral columns of the cord occurs in association with affection of those portions of the anterior columns which adjoin the anterior median fissure. Such degeneration is often spoken of as "descending degeneration," as it usually progresses from above downwards, and is attributable to disease affecting some portion of the motor tract, and the nerve-fibres, which travel along the cord in the situations indicated, are thus cut off from their normal connection with the upper parts of the system of nervous structures, and therefore undergo

degenerative change. [PARALYSIS.] The membranes of the cord are sometimes affected by inflammation (spinal meningitis), and a diffuse inflammation of the substance of the cord (myelitis) is in rare instances met with. [MYELITIS.] Angular curvature of the spine (Pott's curvature), which is a disease produced by the involvement of the vertebrae by tubercular disease, with eating away of their substance and the formation of collections of matter, usually produces symptoms attributable to the pressure which is exerted under the abnormal conditions upon the portions of the spinal cord which are enclosed within the diseased structures. Spina bifida is a form of congenital malformation in which there is a sac-like protrusion of the membranes of the cord through a cleft left in the wall of the enclosing bony canal, the non-enclosure of the cleft being the result of imperfect development.

Spindle-Tree (*Euonymus europæus*), a British shrub, belonging to the order Celastraceae, the wood of which was formerly known as prick-wood, skewerwood, pegwood, and dog-wood. It has ovate-lanceolate, glossy, deciduous leaves, small, pale-green, tetramerous flowers, and fleshy, dehiscent, rose-pink fruits of three or four united carpels, each of which, on splitting, discloses an orange aril covering the one seed it contains. Tennyson speaks of this as

"the fruit,

Which in our winter woodland looks a flower."

Evergreen exotic species, especially *E. japonicus* and *E. latifolius*, are largely grown in the London squares, and flower freely on the southern coasts of England. The *Euonymus* makes an excellent hedge, and since it bears the atmosphere of the sea well, it thrives on the front of coastal towns and watering-places where other shrubs lead a more or less precarious existence. On this account it is justly much esteemed. The American variety is known as the Wahoo, or Burning Bush.

Spindle Whorl, a small perforated disc, sometimes made of lead and elaborately ornamented, formerly used to increase the momentum and maintain the rotation of the spindle.

Spine, a leaf, or part of a leaf, modified into a pointed, hard, woody structure. The term is so often interchanged with thorn that it is perhaps better to speak specifically of a leaf-spine. In the thistles and hollies only the teeth of the leaves become spinous; in Robinia and most acacias, the stipules; in some cases, the primary rachis or phyllopodium of a pinnate leaf after the fall of the leaflets; and in various barberries, marginal teeth or even the whole leaf. The spines of the Cactaceae are mostly leaf-structures. Spines differ from thorns in being lateral and from prickles in being continuous with the woody tissue of the branch or stem.

Spinelle, or SPINEL, is a compound of the oxides of magnesium and aluminum, its composition corresponding to the formula $MgAl_2O_4$.

It occurs naturally, crystallising in forms of the Rhombic system. The crystals may be colourless or tinted, owing to the presence of other metallic oxides which may partially replace the magnesium. By this partial replacement we may thus obtain iron spinelle, a zinc spinelle, etc., with formulae $(MgFe) Al_2O_3$, $(MgZn) Al_2O_3$, etc. The clear and finely-coloured red varieties are valued as ornamental stones in articles of jewellery. They are known as Spinel Ruby, and are found as pebbles in river beds in Burma, Siam, and Ceylon.

Spinning, the process of preparing woollen or other fibre for weaving, is of high antiquity. The most ancient form seems to have been the distaff, on which the wool was arranged, and the spindle, weighted by a whorl, around which the thread twisted itself as the spindle revolved. The next step was to employ the spinning-wheel, by which the spindle was turned. For a long time this wheel formed a familiar object of furniture in every well-appointed house, but it is now well-nigh obsolete. Vast improvements were introduced in the 18th century by a series of famous inventions, which effectually established some of the staple industries of the United Kingdom. These included Lewis Paul's patent (1738) for drawing out a sliver or loose coil of fibre by passing it through successive pairs of rollers revolving at increasing rates of velocity; James Hargreaves's jenny (1764) for spinning a great number of threads at once; Sir Richard Arkwright's spinning-frame or throstle (1767), and Samuel Crompton's spinning-mule (1779).

Spinola, AMBROSE, MARQUIS, general, was born at Genoa, Italy, in 1571. He came of a wealthy and noble family, and, though not a soldier professionally, had acquired some skill in soldiering. The siege of Ostend, which had been conducted for more than two years without much prospect of a successful issue by the Archduke Albert, attracted his attention, and he was given charge of the operations in 1603. He infused such spirit into the leaguer that the town surrendered on September 20th, 1604. During the following years he was in command of the Spanish and Italian contingents in the Netherlands and engaged in a series of duels with his great antagonist, Prince Maurice of Nassau. No definite result had been reached by 1609, when Spain agreed to an armistice for twelve years. On the renewal of hostilities Spinola was engaged in the Rhine Palatinate in 1620 and then passed on to Holland, where his foremost exploit was the capture of Breda in 1625, after a ten months' siege. Failing health, aggravated by disgust at Philip III.'s shabby neglect of his monetary claims, caused him to retire from active service, and he died at Castel Nuovo di Scrivia, Piedmont, on September 25th, 1630.

Spinosa, BARUCH or BENEDICT, philosopher, was the son of a Portuguese Jew, and was born in Amsterdam, Holland, on November 24th,

1632. He took a deep interest in religious systems from an early age, and made himself intimately acquainted with the Bible and the Talmud, the result of which was to satisfy him that he could no longer accept the Jewish religion of his fathers. He translated his first name of Baruch into Benedict, and, despite bribes and other inducements to remain a Jew and much persecution and ill-treatment, boldly proclaimed his scepticism. He studied the various systems of philosophy and made himself proficient in Latin, Greek, metaphysics, and mathematics. He was formally excommunicated on July 27th, 1656, and, his life being in some danger (an attempt at assassination was actually made), was obliged to seek refuge at Rijnsburg, near Leyden, whence, in 1663, he proceeded to Voorburg, near The Hague, and in 1670 to The Hague. In order to procure a livelihood, he worked for the optical instrument makers, but he did not neglect his philosophical researches. He refused an invitation from the Elector Palatine to fill the chair of Philosophy at Heidelberg University. In one view, at any rate, he was wise, for his health was undermined by consumption, and he died on February 21st, 1677. Descartes interested him above all other thinkers, and he wrote a very valuable work about his system. Though charged by his enemies with atheism, he was nothing of the kind, but a Pantheist, believing in God as the eternal and ever-present spirit of nature. The doctrine of free-will he rejected, and individuality finds no place in his scheme. He was a truly religious man, and profoundly influenced many subsequent thinkers and poets. Quite a library of books was written in defence of and against his theories. Personally he was most amiable, and his friends were many and true. *Tractatus Theologico-Politicus* (1670) is his chief work, and he also wrote an admirable treatise on ethics.

Spiraea, a large genus belonging to the order Rosaceæ, including both herbaceous and shrubby perennial plants, natives of the extra-tropical parts of the northern hemisphere. Their leaves are generally stipulate; their flowers small in large anthems; the calyx persistent; the stamens indefinite in number; and the fruit a ring of five or more follicles. There are two British species: *S. Ulmaria*, the meadowsweet, and *S. Filipendula*, the dropwort, but numerous Japanese, Chinese, and other species are cultivated in gardens in England. The Japanese plant, commonly sold as *Spiræa japonica*, is really *Astilbe barbata*, and belongs to the order Saxifragaceæ. It has a cluster of long stiff hairs at the base of the stalk of its tri-ternate leaves, and was at one time named *Hoteia* in honour of a Japanese botanist Ho-tei.

Spires (German, *Speier*, the Roman *Augusta Nemetur*, or *Norviomagus*), an old town on the left bank of the Rhine, 21 miles south of Worms and in the Bavarian Palatinate. Captured by Julius Cæsar in 47 B.C., it became the seat of

a bishop in the 4th century, and of an imperial palace under the Franks about 850. From 1527 to 1689 the supreme court of the empire was established here. All the ancient buildings perished by fire at the hands of the soldiers of Louis XIV. in the latter year except the grand Romanesque basilica (and even this was gutted), dating from 1030. Only a few fragments remain of the Retscher, or imperial palace, where the Diet of Spires met in 1529, and gave to the Reformers the title of Protestants. The manufactures include paper, tobacco, sugar, sugar of lead, leather, vinegar, and beer. Pop. (1900), 20,911.

Spiriferidae, a family of Brachiopoda, or Lamp Shells, common in the Palæozoic rocks, and characterised by the fact that the calcareous rods (or brachia) which support the arms are arranged as a spiral coil. The family ranges from the Silurian to the Lias.

Spirits of Wine, ordinary or ethyl alcohol. [ALCOHOL.]

Spiritualism, in a philosophical sense, denotes the opposite of materialism, and maintains that over and above the matter that composes the human body there is a further informing principle that enables the body to perform its functions. But in a more popular sense it denotes the doctrine that living people can hold converse with disembodied spirits, chiefly by the intermediary of certain peculiarly-gifted persons called mediums. This doctrine, like many other startling things, originated in America, where in 1848 Mr. Fox of New York, with his family, was disturbed by sundry rappings, which practice enabled them to decipher as messages from spirit-land. In 1850 D. D. Home made further developments, such as levitation, etc. Most of the phenomena of rapping, table-turning, spirit-photography, spirit-writing, and the like, can be and have been produced by ordinary means, and much imposture has undoubtedly been practised by some mediums. But after all deduction made there appears to be a residuum of phenomena thus far unexplained by scientific examination, though what this may imply is a matter of conjecture. Among men of trained minds who have become converts to spiritualism are Alfred Russel Wallace, Sir William Crookes, F.R.S., William Thomas Stead, and Professor De Morgan. There are quantities of spiritualistic literature extant.

Spirula, a small Cephalopod, the type of the family Spirulidae, which belongs to the Octopoda. It has a small coiled shell composed of many chambers; this, however, is now rudimentary and internal. The shells are very abundant on the beaches of all tropical coasts.

Spitalfields, a parish in the east of London, adjoining Bishopsgate, 1 mile N.E. of St. Paul's. In the days of the Roman Occupation the district is believed to have been used as a cemetery, since, in 1576, a large number of

funeral urns was discovered containing coin of the Roman Emperors, lamps, pottery, and images. As some Saxon stone coffins were also found at the same time, the inference was reasonable that it had continued to be a burying-ground until the period before the Conquest, if not later. In 1197 Walter de Brunne, Sheriff of London, founded an Augustinian Priory and Hospital of St. Mary, and hence arose the name of the district as the Hospital or Spital, in the Fields. After the dissolution of monasteries in the reign of Henry VIII. the mansions of several merchant princes were erected in the locality, and a century late streets of smaller houses began to be built. At the pulpit cross (which stood till 1642) in the churchyard of the Hospital it had been customary for divines publicly to preach on the Resurrection on the three days following Easter Sunday. Those sermons became known as the Spital sermons and were attended by the children of Christ's Hospital (who, at their first appearance at the services, donned the blue coat and garb afterwards so famous), as well as by the Lord Mayor, Sheriffs, and Aldermen, who did not fail to dine sumptuously later in the day. The services, suspended during the Civil War, were resumed at the Restoration in the choir of St. Paul's, and were again interrupted by the Great Fire. At a later date they were revived in St. Bride's in Fleet Street, and in 1797 were transferred (reduced to two in number) to Christ Church in Newgate Street. But the greatest event in the history of Spitalfields dates from the Revocation of the Edict of Nantes (1685), when Huguenot refugees arrived in England in vast numbers, and the majority of them settled in this neighbourhood. They were mostly weavers, and their settlement founded in London the important industry of the silk manufacture. At the height of its prosperity it was said that the quality of the fabric produced was equal to that of French silks. With the increasing importation of French silks, however, the industry declined in Spitalfields, and periods of severe distress set in. The relief funds established at such times led to an influx of persons from other parts, and the district gradually grew more pauperised than ever. Occasionally the weavers broke out into riot when trade was very bad, and, in 1765, intimidated the House of Lords and had to be dispersed by the Guards. Houses in which power-looms were set up were broken into and the machinery was destroyed. In course of time the industry itself was reduced almost to vanishing-point. Such of the weavers' houses as still remain may be identified by the wide latticed windows running the whole length of the workroom in the upper storey. Nearly all the weavers were bird-fanciers, the birds taking kindly to the whirr of the looms, as canaries now do to the noise of a sewing-machine in a parlour, which seems to have the effect of provoking them to rivalry. At one period the bulk of the linnets, larks,

and finches in the private houses of the metropolis were supplied by the weavers, who went bird-catching in March and October. Many of the master-weavers Anglicised their names, Lemaitre becoming Masters, Leroy King, Tonnelier Cooper, Lejeune Young, Leblanc White, Lenoir Black, Loiseau Bird, and so on. Purely French names are still not uncommon.

Spithead, the strait or channel between the Isle of Wight and the English county of Hampshire. In an enlarged sense, it extends from the Solent and the mouth of Southampton Water to the open sea of the English Channel, with an average breadth of nearly four miles and a length of 12 miles. In a more restricted sense, it is the roadstead outside of Portsmouth and is named from the Spit Sand. Thus defined, it is two miles long and one mile and a half wide. Being sheltered from the south-westers by the island and from the north and east by the mainland, it has long been utilised as a station of the British Navy and is the favourite ground for those colossal naval reviews that have evoked the admiration of the world. It is protected by the system of fortifications that was built to defend Portsmouth. A buoy marks the spot where the *Royal George* foundered in 1782. Other vessels that perished here were the *Mary Rose* in an action in 1545, and the *Edgar* and *Boyne*, which were both destroyed by fire, the former in 1711, and the latter in 1795.

Spitsbergen (the name is Dutch and the common form Spitzbergen is incorrect), a group of rocky islands in the Arctic Ocean, 400 miles N.W. of the North Cape, situated between 76° 28' and 80° 50' N. and 10° 20' and 32° 40' E., midway between Greenland and Nova Zembla. It consists of six large and many smaller members. West Spitsbergen, or New Friesland, the chief, has an area of over 15,000 square miles, a deeply indented coast, and a mountainous surface covered almost entirely with ice and snow. To the north-east lies North-East Land, which is a broad plateau swept by a glacier in parts 3,000 feet thick. To the east, separated from the main island by Wybe Jans Water, lie Barents Island and Edge Island and, farther east, across Olga Strait, Wicke or King Charles Islands, while off the west coast is Prince Charles Foreland. The formation of all is granitic, and they rise from a comparatively shallow submarine plain connecting them with Greenland. A branch of the Gulf Stream keeps the access to the west coast open even till late in the year, and permits the growth of a scanty Arctic vegetation, 130 species of flowering plants being known. The reindeer, once plentiful, is believed to be approaching extinction, but the Arctic fox, Polar bear, and walrus are occasional visitors. Cetaceans are common in the surrounding ocean, though the Greenland or Whalebone Whale is hardly ever seen. The birds appear to be growing scarcer, and especially the eider duck. Spitsbergen was discovered in 1596 by

William Barents, but it was not till 1896 that West Spitsbergen was crossed for the first time, when Sir W. Martin Conway accomplished this feat. In 1897 Herr André made his fatal balloon ascent, in the hope of floating over the Pole. The islands are uninhabited, though occasionally resorted to by explorers and fishers.

Spitz, the Pomeranian dog, a breed with a strain of Eskimo blood. The coat is thick and the muzzle long and pointed, from which feature the dog derives its name (German, *Spitze*, "a point"). These animals are kept as pets, but their temper is uncertain.

Spleen. The spleen is a flattened oblong body which in the adult weighs about 7 ounces; it is situated in the left hypochondriac region adjoining the cardiac end of the stomach. It is invested in a capsule consisting of connective tissue and unstriated muscular tissue fibres, from the inner surface of which processes, or trabeculae as they are called, project and ramify in the interior of the spleen, forming the supporting framework to the spleen tissue proper (the spleen pulp). This last-named substance is of a dark reddish-brown colour, and consists of a mass of cells, many of them like ordinary lymph-corpuscles, and many resembling degenerated red blood-corpuscles. The splenic artery enters the organ at a notch on its under surface known as the hilum, and branches and ramifies in the spleen pulp, its smaller divisions being surrounded by aggregations of lymphoid tissue which form little masses, disseminated throughout the spleen substance, and known as the Malpighian corpuscles of the spleen. The blood conveyed to the spleen in its passage through the lymphoid tissue and spleen pulp undergoes important changes; it is probable that many of the red blood-corpuscles here terminate their existence, and numbers of new white corpuscles appear to be formed. The spleen undergoes rhythmical contraction and expansion in virtue of the large amount of muscular tissue contained in its capsule and trabeculae; it manifests a notable increase in size a few hours after a meal. The spleen has no duct, and is hence classified with the thymus, thyroid, and other bodies as one of the ductless glands. In certain forms of disease great enlargement of the spleen occurs. This is markedly the case in ague and in typhoid fever; in the malady known as leucocythæmia the spleen attains sometimes a very large size. In bygone days the spleen was supposed to be the seat of the emotions that controlled bad temper, melancholy, and low spirits. Hence we have such phrases as "a fit of the spleen" and "to vent one's spleen."

Spleenwort. [ASPENIUM.]

Splenic Fever. [ANTHRAX.]

Splint, a form of surgical appliance designed to keep a limb or other portion of the body in a fixed position. Splints are of special service in the case of fracture of a bone where it is

necessary to preserve the proper apposition of the injured parts with a view to favouring the processes of repair, and securing the coalescence of the broken ends in such a position that no deformity shall result. Splints are usually made of pieces of padded wood, which are adjusted to the injured limb by strapping and bandaging. Plaster-of-Paris is largely used in the manufacture of splints, a bandage, into which the dry powder has been rubbed, being applied to the limb and moistened with water as it is adjusted, and every care being taken to preserve the parts in proper position until the plaster sets.

Spohr, LUDWIG, or LOUIS (the form he adopted in his *Selbstbiographie*), composer and violinist, was born at Brunswick, in North Germany, on



LOUIS SPOHR.

April 5th, 1784, and studied under several musicians, of whom the chief and most capable was Franz Eck. In 1805 he became musical director at the Court of Saxe-Gotha, and in 1813 director of the Vienna theatre, a position which he resigned two years later, in order to tour. Returning to Germany in 1817, he was appointed conductor at the opera in Frankfort-on-the-Main, where he produced *Faust* (1818), one of his finest works, and *Zamire und Azor*. In 1820 he appeared at the Philharmonic Society's concerts in London, a visit historically interesting, since he used the conductor's bâton at the third concert for the first time in the Society's existence. On January 1st, 1822, he began his duties as Hofkapellmeister to the Elector of Cassel and next year brought out his opera of *Jessonda*, which was enthusiastically received. At Düsseldorf he conducted his oratorio of *The Last Judgment* (*Die*

letzten Dinge, to be distinguished from his *Die jüngste Gericht* of 1812), the greatest of his sacred compositions. In 1827 he produced his opera of *Pietro von Abano*, and in 1830 his *Der Alchymist*. In the following year he published his *Violin-School*, a work that must always link his name with the instrument of which he was so admirable an interpreter. In 1835 he produced at Cassel his oratorio of *Heiland's letzte Stunden* (repeated as *Calvaria* at the Norwich Festival of 1839, where Spohr met with a reception of unexampled fervour. For the Norwich Festival of 1842 he wrote *The Fall of Babylon*, though the Elector persistently refused to allow him leave of absence to conduct it. His last opera, *Die Kreuzfahrt* (*The Crusaders*), was produced at Cassel in 1844. During his régime at Cassel he brought out Richard Wagner's *Der Fliegende Holländer* in 1842, and *Tannhäuser* in 1853. He died at Cassel on October 22nd, 1859. As a composer he only failed to reach the very highest rank because he lacked inspiration; and as a violinist he was unsurpassed in his day, it being said of him that he made the instrument sing.

Sponge, the skeleton of the animals forming the Porifera, a class of animals belonging to the phylum Coelenterata. The members of the Porifera differ very markedly from the remaining Coelenterata by their very varied and variable shape; they form irregular masses, the individual members of which have no tentacles and thus appear far less highly organised than the compound Anthozoa. A few, however, have a definite form. This is typically shaped like a funnel, and is shown in its simplest style in such a genus as *Leucosolenia*; in others it becomes more complex, and consists of a tubular structure supported by a trellis-work of siliceous spicules, as in the exquisite Venus's Flower Basket (*Euplectella*); in others the sponge consists of a fleshy, creeping mass, as in *Homoderma*, the type-genus of the Homodermidae; in others (the family Clionidae) the animal lives in borings in shells. In attempting to form an idea as to the structure and affinities of a sponge it should be regarded as composed of a large number of cells belonging to two different layers, separated by the gelatinous, irregular material known as "mesoglea." The two layers are the ectoderm and endoderm; the former consists of flattened cells, and forms the external layer of the body. The endoderm is typically composed of larger cells, each with a whip-like process or flagellum, which rises from the centre of a neck-like extension or collar; so these cells resemble a rounded bottle with a short, thick neck, with a cord rising from the centre of the neck. The endoderm lines a series of tubes, which ramify throughout the mass of the sponge; the typical "collar cells" may line the whole length of these (in the Homocela) or be restricted to special parts of the tubes or bladder-like expansions of the tubes known as ampullae (as in all but this order

These tubes may open to the exterior by a series of pores, which occur in great abundance over the whole surface of the sponge; they may be all of the same size, or some may be small (micropores) and others large (macropores). The pores are typically "inhalant"—i.e., the currents of water which bring the sponge its food and fresh water for respiratory purposes all enter the sponge by them; but in those sponges which have not also a series of larger exhalant apertures known as "oscula" some of the pores have to allow of the escape of the surplus water. The oscula begin as a single large aperture, which usually divides into many small ones. The tubes which ramify throughout the sponge form the "gastric cavity," which may consist of (1) a simple, central, vase-shaped cavity, as in such primitive forms as the Asconidæ; (2) this central cavity may be replaced by a series of radial exhalant canals as in the Syconidæ; (3) it may consist of a series of canals with ampullæ—i.e., pear-shaped or spherical expansions. The skeleton of the sponge consists of a series of "spicules" or small rods formed by cells in the mesogloæ; they are composed either of a soft but tough material allied to silk and known as "spongin," as in the Common Sponge (*Euspongia*); of silica, as in the Venus's Flower Basket; or of carbonate of lime, as in the sub-class Calcareæ. The spicules are of four main types: (1) monaxile—simple rods, curved or straight; (2) triaxile—composed of three rods crossing, and thus usually six-rayed, as in Hexactinellidæ; (3) tetraxile—composed of four rods, but one of these is often suppressed—which occur in the Lithistidæ; (4) polyaxile—of many axes, and forming stellate or globular spicules; these are free. The spicules are either united to one another by interlocking spines, or by spongin or the deposition of carbonate of lime or silica; or they may be free, and are then known as "flesh spicules." The sponges are classified, in the main, according to the structure of the skeleton and the nature of the gastric cavity. By the first character they are divided into two sub-classes—the Calcareæ, in which the skeleton is composed of carbonate of lime; and the Fibrospongiæ or Noncalcareæ, in which the skeleton is composed of silica or spongin, or is absent. The Calcareæ are divided into two orders, according to the second character; thus in the Homocœla the gastric cavity is lined throughout with collared cells, and in the Heterocœla the collared cells occur only in special portions of the gastric cavity, either in radiating tubes or special bladder-like expansions known as ampullæ. The first order includes the three families of the Asconidæ, Homodermidæ, and Leucopsidæ; the latter consists of the families of Syconidæ, Syllidæ, Leuconidæ, and Teichonidæ. The Non-Porifera are divided into three orders:—(1) The Hyalospongiæ, including all the Hexactinellidæ, which are very abundant as fossils, and range from the Cambrian period onwards; the group is characterised by the possession of

a silicious skeleton composed of six-rayed spicules often united into a lattice-like tissue. The Venus's Flower Basket, or *Euplectella*, is the best-known living species. (2) The Spiculispongiæ, in which the skeleton is composed of silicious spicules which are either four-rayed or consist of a single spine; these are often quite disconnected. It includes five sub-orders: the Lithistina, in which the skeleton is massive, and the spicules are united to one another—this group is very important to the geologist; Tetractina, with four-rayed and one-rayed spicules; Oligosilicina, with only small isolated flesh spicules; Pseudotetraxonia, with one-rayed and flesh spicules; and the Clavulina, including the boring Sponges, Cliona. (3) The Cornacuspongiæ, with spicules if present only of a single spine, united by spongin, or formed only of spongin fibres. This includes two sub-orders: the Halichondrina, of which the Freshwater Sponge (*Spongilla*) is the best-known form; and the Keratosa, including all the soft sponges of commerce. The systematic position of the sponges has been much debated, but embryological evidence is conclusive as to their being Coelenterata. The sponges are all marine, except the two freshwater genera, *Spongilla* and *Meyenia*. The others occur in all seas and at all depths, but the Hexactinellidæ usually occur in deep water. The sponges vary in size from minute bodies, one-twentieth of an inch in length, to enormous masses. Many species occur round the English coasts. The sponges used for washing purposes live in shallow water in warm seas; the best ones come from the Levant and the Greek archipelago, but the largest part of the supply is yielded by the West Indian fisheries, especially around the Bahamas. Owing to the indestructibility of the spicules, the sponges are of great importance to the geologist, for, as we have seen, they are abundant as fossils from the Cambrian period onwards. Their spicules often occur in such abundance on "fossil sponge banks" as to form thick beds of silicious rock, such as the cherts of the Lower Greensand.

Spongilla, the common Freshwater Sponge. It may be found attached to stones and wood in either stagnant or running water. There is one English species, *Spongilla lacustris*, while a closely allied form, *Meyenia fluviatilis*, lives in streams. The latter grows in dense masses, while the true *Spongilla* is erect and plant-like. When it grows well exposed to light it is of a green colour. Professor W. J. Sollas surmises that the fact that out of the many hundreds of widely different kinds of sponge only a small rigidly-defined group inhabits inland waters, is due "not to the inability of sponges to adapt themselves to fresh water, but rather to the fact that they are propagated by ciliated larvae, which drift about at the mercy of every current, and cannot, therefore, ascend a river where the current is always seaward." This theory, he adds, "will probably account for the absence of

many other marine forms of life which one might expect to find amongst the fauna of rivers."

Spontaneous Combustion occasionally occurs in bodies when they are in such a state that they can undergo intense chemical action; the energy of the action may be sufficient to cause luminosity and flame. Many substances in a fine state of division will take fire in the air. Reduced iron, for instance, becomes oxidised so rapidly that heat and light are both produced. When powdered antimony is dropped into chlorine the two elements combine with so much vigour that brilliant sparks are formed. If lead tartrate be heated in a tube for some time, all the carbon is burnt away, and the tube can be sealed up while hot with its fine deposit of lead. When the tube is opened the lead takes fire as it comes in contact with the air. Phosphorus can be exposed at ordinary temperatures in the air without catching fire; but if it be dissolved in carbon bisulphide and the solution be allowed to evaporate, the deposit of phosphorus ignites spontaneously. Charcoal under certain conditions—e.g., when saturated with oil—has been known to take fire suddenly, and the presence of certain compounds of iron in coal has been known to cause its spontaneous combustion. Many organic substances will also undergo fermentation or oxidation sufficient to cause their ignition, if they are massed in large quantities. This is specially common in the case of hay or straw ricks when the ricks have been made of damp material. Cotton-waste saturated with oil, greasy woollen rags, and other things of a similar nature, are all liable to sudden combustion. The cases of so-called spontaneous combustion of the human body have generally been explained in some more satisfactory manner. In most cases a person impregnated with alcohol has actually caught fire and been burnt, the combustion starting from without and not spontaneously.

Spontaneous Generation (*generatio euvoca* or abiogenesis), the view held by Aristotle and championed of late years by Henry Charlton Bastian, that some of the lowest organic beings originate from non-living matter. This view was attacked by Francisco Redi (1626—98) and by Leeuwenhoek (1632—1723), though defended by Lamarck (1744—1829). Whatever speculation may have to say as to the first origin of life in the remote past, all experimental evidence as to "sterilised" organic infusions, etc., is against any such process taking place at present.

Spontini, GASPARO LUIGI PACIFICO, composer, the son of a peasant, was born at Majolati, near Jesi, Italy, on November 14th, 1774, and received his musical education at Naples, under Sala and Tritto, for counterpoint and composition, and Tarantino for singing. At the age of twenty-two he produced his first opera, *I Puntigli delle Donne*, with great success at

Rome. He was a prolific composer, and from that time forwards wrote unceasingly. After living in Naples till 1803 he went to Paris where his first two works in comic opera were hissed off the stage. *Milton*, however, a one act opera, was well received (1804), and *L Vestale* (1807) was so successful when a hearing was at length allowed, it as to crush a opposition. *Fernand Cortes* (1809) aroused equal enthusiasm. His *Olympia*, produced in 1811 was greeted coldly, and it was not until 1821 after it had been several times revised in parts, that it proved acceptable to the public. At the urgent insistence of Frederick William III. he settled in Berlin in 1820 as Kapellmeister and Court Superintendent of Music. Among the works produced here were *Nourmah* (1822), *Alcidor* (1825), and *Agnes von Hohenstaufen* (first act, 1827; three acts, 1829; remodelled, 1837). On several accounts Spontini had never been popular in Berlin and when the King died (1840) almost the only powerful friend he had passed away. His cantankerous disposition almost at once brought him into trouble, but Frederick William IV., while dismissing him, pensioned him on the most generous terms. He resided in various towns on the Continent for longer or shorter periods, but produced no more works. In 1850 he retired to his birthplace, where he died on January 14th, 1851, leaving all his property to the poor of Majolati and Jesi.

Spoonbill (*Platalea leucorodia*), a large wading bird allied to the ibis and the stork, and named from the spoon-like enlargement of



SPONBILL.

the tip of the bill. It was formerly native in the Fen country of England, but now occurs only as a visitor. It still nests in Holland though, as the lakes are drained, even there it is growing rarer. It does not occur in the northern latitudes of Europe. The length is

about 30 inches; the plumage is white with a pinkish tinge, and the bill and legs are black. The flesh is valued for the table. The Roseate Spoonbill (*P. ajaja*), from Central America, differs little from the common species except in its plumage.

Spore, a specialised reproductive cell, in itself asexual, capable by itself of giving rise to a new organism. The spore may originate either asexually—i.e., from a single mass of protoplasm—or sexually, from the fusion of two masses. It is generally a single cell or nucleated mass of protoplasm. It may have no cell-wall and may then be motile, when it is termed a zoospore. Zoospores may be ciliated, as in many Algae and in a few Fungi, or amoeboid, as in the Myxomycetes and in a few Algae. The non-motile naked spores of the Floridæ are either tetragonidia, produced asexually, or carpospores, produced sexually. When a spore has a cell-wall it is commonly thick, and may consist of two layers—the outer cuticularised extine, exine, or exospore, and the more delicate inner intine or endospore. The asexually-produced spores of the sporophyte are either all alike, as in most ferns, horsetails, and Lycopodium, when the plant is termed homosporous or isosporous; or they are of two kinds, differing in size and in the sex of the organs to which they give rise. The plant is then termed heterosporous, as in the case of the Selaginella, the Hydropteridæ, and the Spermatophyta, the smaller spores, which give rise to male organs, being termed microspores or pollen-grains, and the larger megaspores, macrospores, or embryo-sacs. Asexually-produced spores originate in a sporangium or by abstriction, a process of budding on a branch hypha. In thallophytes the sporangium is unicellular; in higher plants it is multicellular; and in heterosporous forms two kinds of sporangium occur, the microsporangium or pollen-sac, and the megasporangium or ovule (nucellus). Sporangia are generally borne on special leaves or sporophylls, such as the staminal and carpellary leaves of Spermatophytes, but are in some cases axial. In ordinary ferns and Hydropteridæ the sporangium originates from one cell (leptosporangiate); in other vascular plants, from a group of superficial cells (ensporangiate).

Sporophore, or SPOROPHYTE, the stage or generation in the life of a plant that produces asexual spores, as distinguished from the alternating stage or generation, the gametophyte, in which sexual reproductive organs are produced. In Bryophyta and in most Thallophyta the sporophore is relatively small and of an appendicular character, being, for instance, in mosses what is known as the capsule or theca, with its stalk or seta. In Pteridophyta the sporophore becomes relatively far more important than the gametophyte, being the entire stem and leaves of the leafy plants, whilst the gametophyte is merely the prothallium. In flowering-plants, again, the spore-

phore becomes even more important, being the whole plant except the contents of the pollen-grains and the archisperm.

Sporozoa, a class of Protozoa, including those which live as parasites within other animals, and which reproduce by the formation of spores resembling in some cases those of some plants. The individuals either have no special organs of locomotion or only some imperfectly developed pseudopodia. The class is divided into four groups—namely, the Gregarinida, which live in earthworms, frogs, mollusca, etc.; the Amœbosporidia, which infest beetles; the Sarcosporidia, or "Rainey's corpuscles," which live in the muscles or soft tissues of some mammals and birds; and the Myxosporidia, which are parasitic in fish. The Gregarinida is the best-known and most important subclass.

Spotted Fever, or CEREBRO-SPINAL FEVER, as it is more exactly termed, is an infectious fever, occurring usually in epidemic form. It has been recognised since the beginning of the 19th century, but probably has existed at least from the Middle Ages. At times there have been destructive outbreaks in Germany, the United States, France and, less frequently, in Ireland. It was thought to have practically disappeared from Great Britain, but this belief was rudely disturbed in 1907 and towards the end of 1906 by an epidemic in Glasgow in which the death-rate was appalling and the visitation of the severest character. It appeared in other towns in Scotland and also in England and, more sporadically, in Ireland. It scourged the poorer quarters of the community, where over-crowding and neglected sanitation have lowered the vitality and sapped the resisting-power of the inhabitants. Schools, workhouses and barracks are much more liable to attack than individuals. Males are more frequently the victims than females and, in the vast preponderance of cases, children are the only sufferers. There is reason to believe that it is due to the organism known as meningococcus, since the characteristic of the disease is inflammation of the membranes of the brain and spinal cord, and this germ has been discovered in the fluid surrounding the brain and spinal cord in fatal cases. Some medical men, however, have ascribed it to the bacillus that causes pneumonia in the lungs. We are still in the dark as to how it is transmitted. It seems never to be conveyed by water or food and instances of direct infection are rare, though it has been borne from one victim to another by a third person and has also been carried in clothing. The organism remains active for a long period outside of the body, and as it has been found in the discharges from the nose and eyes as well as in the excreta the necessity for complete and prompt disinfection cannot be exaggerated. One curious circumstance is that domestic animals have shown symptoms of disorder during epidemics and it has therefore been plausibly argued that dogs and cats, and pigs in Ireland, may be promi-

nent agents in the dissemination of the disease. Cold, injuries to the head, mental strain and brain fag are conditions that increase the risk of infection. In an epidemic the earlier cases appear to be the severer. The attack sets in with a general feeling of malaise and is very sudden. The patient is prostrated with fever, shivering fits, headache, giddiness, violent muscular spasms, pains all over the body and persistent vomiting. He soon becomes restless, irritable and delirious. The head in most cases is drawn strongly backwards. The sufferer may lie on his side with the legs drawn up, but he screams if touched, or even if the bed clothes are moved, such is the sensitiveness of the skin and so exquisite is the pain caused by the contraction of the muscles, especially those of the neck and back. Sometimes the attack is so severe and grows in intensity so rapidly that the patient dies in a day or two from collapse, or passes into a state of unconsciousness from which he never emerges, or the complaint lasts for weeks and then fatal complications, such as inflammation of the lungs and other respiratory organs, arise. Deafness and blindness occasionally supervene and are apt to be permanent. Convalescence is prolonged, the patient having been reduced to a condition of extreme emaciation. When the attack is mild, a few days' confinement to bed may be all that is necessary for recovery. The rash, to which the disease owes its popular name, is by no means invariably present, which shows the unwisdom of calling serious illnesses by nondescript names, since it is obvious that a patient might be far gone with cerebro-spinal fever before his friends, on the outlook for spots, realised the gravity of the ailment. The real rash consists of dark purplish spots, caused by hæmorrhage beneath the skin, and in some cases found plentifully all over the body, in which event the onset is probably very severe. At times they are more often noticed on the feet than the body. The eruption resembling that of chicken-pox which is sometimes seen on the face and especially on the lips is not necessarily characteristic. No time must be lost in summoning the medical man. The general course of treatment requires ice to be applied in rubber bags to the head and back to subdue the inflammation, mild purgatives and a simple fever mixture. Opium and quinine are recommended by some physicians. Food, in the form of nutritive fluids, should be given frequently and regularly and, in prostration, brandy may be required. The patient must, of course, be isolated and his room disinfected. Temporary improvement is at times deceptive, and treatment must be continued till recovery is assured. Of heroic remedies one is surgical. The spine is opened from behind and the diseased fluid around the spinal cord and brain is washed out. The other is the administration of serum. The former mode of treatment sometimes succeeds, but the serum treatment has not answered expectations.

Spottiswood, JOHN, archbishop and historian eldest son of the Scottish Reformer of the same name (1510—85), was born in 1565 and educated at Glasgow University. Taking holy orders, he succeeded his father in the charge at Calder, in Mid Lothian. As the relations between the Kirk and the King grew strained, he acted with the party which favoured the growing sympathy of James VI. with episcopacy, and, soon after James ascended the throne of England, in 1603, succeeded James Beaton as archbishop of Glasgow, and, two years later, was admitted a member of the Scottish Privy Council. In 1610 he was Moderator of the Assembly at which presbytery was abolished and was consecrated to the episcopal office later in the year. In 1615 he was transferred to the archbishopric of St. Andrews. At the General Assembly in Perth in 1618 he arbitrarily took the Moderator's chair and was the prime mover in the adoption of the Five Articles of Perth, which ordained (1) that the Communion must be taken kneeling; (2) that in sickness Communion might be administered privately; (3) that baptism might also be administered in similar circumstances; (4) that children should be brought to the bishop for a blessing; and (5) that festival days should be restored. In course of time he discovered that the spirit of the country was antagonistic to his proposals, and the riot in St. Giles's Church in Edinburgh (1637), when Jenny Geddes hurled her stool at the Dean's head, and the signing of the Covenant (1638) finally convinced him that prelacy was doomed in Scotland. He retired to Newcastle for safety, and then went on to London, where he died on November 26th, 1639, and was buried in Westminster Abbey. He is best known by his *History of the Church and State of Scotland from A.D. 203 to 1625*, which was not published until 1655.

Spottiswoode, WILLIAM, mathematician, was born in London on January 11th, 1825, his father being partner in the great printing house of Eyre and Spottiswoode. He was educated at Laleham, Eton, Harrow, and Balliol College, Oxford, where he specially distinguished himself in mathematics. In 1846 he succeeded his father in the printing establishment and next year published *Meditationes Analyticae*, in which his scientific attainments were amply illustrated. Of his tour in Eastern Russia in 1856 he published an account in the following year and in 1860 he visited Croatia and Hungary. In 1865 he was President of the mathematical section of the British Association, and in 1871 pursued researches in the polarisation of light which resulted in his well-known books, *The Polarisation of Light* (1874) and *Polarised Light* (1879). In 1878 he was elected President of the Royal Society (of which he had been a Fellow since 1853), and died in London on June 27th, 1883, being buried, like his ancestor the Archbishop of St. Andrews, in Westminster Abbey.

Sprain. As the result of a sudden wrench or fall injury is often inflicted on some of the soft parts of the body, and particularly on the muscular and ligamentous structures, without actual breach of continuity of the bones. Pain and swelling occur, and to such a condition, in the absence of actual fracture or dislocation, the term sprain is applied. Sprains are particularly common in the neighbourhood of joints, the ligaments of which may be stretched or torn in consequence of the injury. The treatment of sprains in the early stages consists in rest for the affected parts, and in the application of cold lotions, lead lotion being that usually employed. Later, the employment of warmth is often grateful to the patient, and as soon as inflammation has subsided friction of the part involved should be resorted to, and the patient should move it about with a view to preventing the formation of a stiff joint.

Sprat (*Clupea sprattus*), a small fish of the Herring family, found in great numbers on many parts of the shores of the British Isles and on the coasts of Europe washed by the Atlantic. In shape and colour it closely resembles the herring, but is much smaller, not exceeding six inches in length, with an average of three inches, and may be easily distinguished from the larger fish by the sharply-notched edge of the abdomen, the more forward position of the ventral fins, and the absence of vomerine teeth. Sprats are often taken in immense numbers, so that the London and other markets are overstocked, and large quantities are used for manure. Sprats are excellent eating, and would be more highly valued if they were not so plentiful. Vast numbers are dried for future use or export; on the Baltic coasts they are cured with spices; and at Deal there are factories where they are put up in oil like sardines. The ova of the sprat are shed in the open sea, though not far from land, and the young fry are sold as whitebait.

Spree, a river rising in the mountainous country in the south-east of Saxony and pursuing a northerly and latterly a north-westerly course through the Prussian province of Brandenburg and falling into the Havel at Spandau, after a total run of 220 miles. Vessels of 500 tons ascend as far as Köpenick, a few miles above Berlin, while ships of lighter burden can proceed upwards to nearly half its length. It passes through the heart of the city of Berlin and is connected by canal with the Oder.

Sprengel Pump, a particular kind of air-pump, in which mercury is a special feature, employed for producing a vacuum and used for practical purposes as well as in laboratory and platform experiments. It is sometimes known as the Mercury Air-pump. [AIR-PUMP.]

Sprenger, ALOYS, Orientalist, was born at Nasserent, in Tirol, on September 3rd, 1813, and studied medicine at Vienna. His interest

in Oriental peoples dated from an early period, and in 1836 he collaborated with Münster in the great work on *The Military Sciences among the Mussulmans*. In 1843 he went to Calcutta, and held various appointments in other Indian cities, and after his return to Europe became professor of Oriental languages at Bern in 1858. He died at Heidelberg on December 19th, 1893. He published various works including translations into English of *The Gulistan* of Sadi (1851), a *Life of Mahomet* (1851), and *Selections from Arabic Authors* (1845). He also translated English works into Arabic, and wrote in German *The Life and Doctrine of Mahomet* (3 vols., 1861-5).

Spring Balance, a weighing machine which depends for its action upon the fact that the extension of a spiral spring is proportional to the applied force. In its simplest form it is merely such a spring flexed at its upper end and provided at its lower end with a hook or pan to hold the article to be weighed, and an index moving over a graduated scale. In order to obtain greater sensitiveness, a rack and pinion or their equivalent is sometimes used to cause the movement of the lower end of the spring to result in the rotation of a pointer over a graduated dial. In some balances the weight is measured by the amount of bending produced in a flat curved spring, to one end of which a pointer is fixed.

Springbok (*Gazella euchore*), a beautiful South African antelope, some 30 inches high, deriving its popular name from its great agility and



SPRINGBOK.

marvellous leaps. When alarmed or whilst it runs it leaps straight up into the air for several feet. The horns are lyrate and, in the females, very small. It frequents the sandy plains, and is found in large herds, which make partial

migrations in search of food. The general colour is brown above and white beneath, marked off on the flanks by a broad wine-red band. On the back are two folds of skin which open when the animal leaps, and show a broad white patch. Owing to the settlement of the country the Springbok has retired farther to the north and its numbers have diminished. But in the first half of the 19th century their migrations, according to Colonel Charles Hamilton Smith (1776-1859), were conducted on a remarkable scale. The creatures congregated on the Karroos and travelled from north to south and back with the monsoons. "These migrations, which are said to take place in the most numerous form only at the interval of several years, appear to come from the north-east, and in masses of many thousands, devouring, like locusts, every green herb. The lion has been seen to migrate and walk in the midst of the compressed phalanx, with only as much room between him and his victims as the fears of those immediately around could procure by pressing outwards. The foremost of these vast columns are fat, and the rear exceedingly lean while the direction continues one way; but with the change of the monsoon, when they return towards the north, the rear become the leaders, fattening in their turn."

Springfield, the capital of Illinois, United States, 185 miles S.W. of Chicago, situated on a plateau four miles south of the Sangamon. It contains several notable buildings, amongst them the State Capitol, with a central dome 364 feet high, the State arsenal, the court-house (the old Capitol), the natural history museum, public library, and several educational and charitable institutions. The house in which Abraham Lincoln resided is preserved by the State and in Oak Ridge cemetery, adjoining the town, where he was buried, a national monument was erected to the President-hero in 1874. In the vicinity of Springfield are deposits of bituminous coal, and the industries include iron-rolling mills, watch factories, boiler works, and engineering, besides manufactures of woollens, leather, soap, paper, flour, beer and agricultural implements. It is one of the most important horse-breeding centres in the Union. Pop. (1900), 34,159.

Springfield, a town of Massachusetts, United States, on the left bank of the Connecticut, 98 miles W.S.W. of Boston. Settled in 1636 by William Pynchon (1590-1662) it was first called by the Indian name of Agawam, but this was changed in 1641 to its present designation, in memory of Springfield in Essex, England, its founder's birthplace, whither Pynchon was compelled to return to escape clerical persecution. The principal buildings are the city hall, court-house, library, art museum, museum of science, the United States arsenal (established in 1777) and armoury (dating from 1795), the French-American College, and St. Michael's Cathedral (Catholic). The industries comprise iron- and brass-foundries, machine-shops, and

engineering, besides manufactures of fire-arms, paper, cottons, woollens, rubber goods, tobacco and cigars, bicycles, motor-cars and electrical apparatus. Springfield is a handsome-looking town and Forest Park, its chief recreation ground, contains 464 acres. Pop. (1900), 62,059.

Springs, the risings of subterranean waters to the surface of the ground, may be broadly divided into two classes—surface or gravitation springs, where the water descends continuously to the point of outflow, and deep-seated springs, where it rises by hydrostatic pressure. Those of the first class mostly occur in undisturbed strata, where a porous bed cropping out at the surface receives rainfall; its water is held up by an underlying impermeable bed, and at some lower level the line of junction of the two beds comes to the surface. The second and more common class occurs in disturbed areas, the water following a labyrinthine up-and-down course through subterranean fissures and joints, and often reaching the surface along a line of fault. The water of springs may range in temperature almost from the freezing-point, as in some *glacières* or deep caverns in snow-clad mountains, up to boiling point. Hot or thermal springs are most frequent in volcanic regions, but may occur elsewhere (as at Bath, in England, where they have a temperature of about 120° F.), when they probably come from a considerable depth. Spring water contains in solution atmospheric gases, carbon dioxide from the soil, and various gases from deeper rocks. Organic acids may be present, and mineral constituents mainly vary in proportion according to temperature, from less than 1 to 300 grams per litre. The chief mineral salts present are calcium, magnesium, and sodium carbonates, calcium and sodium sulphates, and sodium chloride. When more than 1 gram per litre is present the water ceases to be ordinary drinking-water, and the spring is termed a mineral spring. Where drinking-water only contains alkaline salts and dissolves soap without forming curd it is termed soft, but where calcium, magnesium, or ferrous carbonates, sulphates, or chlorides are present, curd is formed from the fatty acids of soap, and the water is called hard. Hardness due to bicarbonates, which are decomposed by boiling, the carbonate being precipitated, is termed temporary; that due to the undecomposable sulphates and chlorides as permanent. The chief kinds of mineral springs are calcareous, containing calcium-carbonate; chalybeate or ferruginous, containing ferrous sulphate, which decomposes and deposits iron rust (hydrous oxide); or saline, containing a brine chiefly of chlorides, with calcium sulphate and various other substances. Mineral springs believed to have curative effects are called medicinal, of which the chief varieties are the sulphurous containing hydrogen-sulphide, as at Harrogate; the bitter, containing magnesium-sulphate, as at Cheltenham and Sedlitz in Northern Bohemia; and the alkaline,

containing especially sodium-carbonate. Oil springs contain a variable proportion of petroleum mixed with their water. In addition to feeding rivers, the chief geological action of springs (at the surface) is the deposition of travertine, which when rapid gives them the name of petrifying springs, though they merely encrust with carbonate of lime. Chalybeate springs produce an ironstone moorband pan below the surface in badly drained districts, and the hot waters of geysers contain in solution large quantities of silica, which they deposit as geyserite or silicious sinter.

Spring-tails. [COLLEMBOLA.]

Spruce, a name commonly applied to the whole of the coniferous genus *Picea*, but especially to *P. excelsa*, the Norway Spruce. The genus is characterised by its scattered four-sided leaves with projecting cushions below them; pendulous woody cones, with thin scales, ripening the first year and falling off whole; short, concealed, almost free bracts; winged pollen-grains; small seeds with large obovate wings; and four- to five-lobed cotyledons, each lobe being three-edged. The Norway Spruce is a handsome tree, growing best in moist valleys and reaching 150 feet in height. Its timber is known as white deal, but in Northern Europe is not nearly as valuable as that of the Northern Pine (*Pinus sylvestris*). A resin known as frankincense exudes from the stem, and Burgundy pitch is prepared from it. An infusion of the young shoots is used in the preparation of spruce beer, which contains treacle, is fermented with yeast, and is a wholesome beverage, not unpleasant to the taste and useful as an antiscorbutic. Some sixty varieties in cultivation for ornament have been named. Other well-known species of *Picea* are *P. alba* and *P. nigra* (also known as *P. rubra*), natives of North-East America.

Spumellaria. [RADIOLARIA.]

Spur, a pointed instrument worn on the rider's heel for the purpose of goading the horse. Up till early mediæval times it was furnished with a single point, and subsequently with a rowel (or revolving ring armed with three or more radiating points). Spurs were used by the Romans as early as 200 B.C. They were named after, and perhaps copied from, the horny claw-like outgrowth (from the side of the metatarsus) on the foot of many birds. They are attributes of knighthood; so that "to win one's spurs" means primarily to gain the honour of knighthood, and then to make oneself a reputation. In history "The Battle of the Spurs" was the bloodless rout of the French knights by Henry VIII. near Guinegatte, in the department of Pas-de-Calais on August 16th, 1513. The French under the Duke de Longueville were surprised and fled, there being no time to form any array of battle. Lodge's surmise that the combat took its name from a village called "Spours, near which it was fought," seems like a kindly conjecture

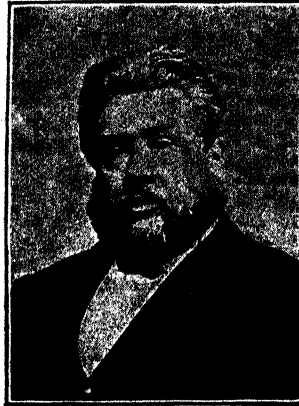
to save the *amour propre* of the French. That village is hard to find. The first "Battle of Spurs," in which the Flemings defeated Robert, Count of Artois, at Courtrai in Belgium, on July 11th, 1302, was so named from the number of gilt spurs that were afterwards gathered on the field.

Spur, in botany, a pouch-like appendage to perianth leaves, connected with the secretion of nectar. In *Tropæolum* the spur is mainly formed from one sepal, as also in *Pelargonium*, in which it is adherent. In *Biscutella*, a genus of Cruciferae, two sepals are spurred; in *Viola*, one petal; in *Epimedium grandiflorum*, all four; and in the Columbines, all five petals. In most spurs the nectar is excreted by the inner surface and received in the pouch; in *Viola*, the secretion is performed by the two tail-like appendages of the stamens; and in orchids, which were in consequence mistakenly termed by Sprengel "sham nectar-producers," it takes place within the tissues of the petalline spur, so that the insect-visitor has to bore for it. The length of a spur is in relation to that of the proboscis of the insect-visitor. That of the Madagascar orchid, *Angraecum sesquipedale*, is 9 inches in length.

Spurge, a plant of the genus *Euphorbia*. Amongst the species are the Branched Spurge (*Ernodea littoralis*) of the sea-coast of Florida and the West Indies; the Caper Spurge (*Euphorbia Lathyris*) of South Europe and West Central Asia, the young fruit of which is sometimes used for capers; the Cypress Spurge (*E. Cypressus*), the foliage of which, with its crowded linear leaves, suggests the cypress; the *Ipecacuanha* Spurge (*E. Ipecacuanha*), the root of which possesses active emetic and purgative properties, but is apt to provoke excessive nausea and distress and is inferior to the true *ipecacuanha*; and the Sun Spurge (*E. Helioscopia*), also called Cat's Milk, Littlegood, and Wartweed or Wartwort, the flowers of which follow the sun. [EUPHORBACEÆ.]

Spurgeon, CHARLES HADDON, preacher, whose ancestors were Dutch refugees from the persecution of the Duke of Alva in the Netherlands, was born at Kelvedon, in Essex, England, on June 19th, 1834. He received most of his education at Colchester, and on its termination was for a time tutor at Newmarket. Beginning evangelical work at Cambridge whilst a youth, he won a reputation as "The Boy Preacher," and was only eighteen when he was appointed to the charge of a Baptist chapel at Waterbeach, Cambridgeshire. Though reared as an Independent and converted in a Primitive Methodist chapel, he formally joined the Baptists in 1850. In 1854 he was called to the chapel in New Park Street, Southwark, where he preached with such acceptance that the congregation was soon crowded out and he ministered first at Exeter Hall and afterwards in Surrey Gardens, pending the erection of the Metropolitan Tabernacle, in Newington Cause-

way. This building, which cost £31,000 and accommodated 6,000 persons, was opened in 1861 and was the scene of Spurgeon's labours to the end of his life. He was a man of extraordinary business capacity and organisation and in 1856 founded the Pastors' College, for training young men for the ministry, and in 1867 the Stockwell Orphanage for poor boys and girls, having in the year before also established a Colportage Association. He also started in 1865 a monthly magazine called *The Sword and Trowel*, of which he was the editor, and, besides publishing week by week from 1855 a sermon by himself, wrote several books, including *The Saint and his Saviour* (1857), *Morning by Morning* (1868), *Evening by Evening* (1868), *John Ploughman's Talk* (1869), and *The Treasury of David* (1870-85). He died at Mentone on January 31st, 1892, and was buried in Norwood Cemetery, London. He made no claim to scholarship, had no sympathy with modern thought and criticism and preached undiluted Calvinism from first to last. As an orator he was very unequal (which, considering his output and activity, is hardly surprising), and never quite lost a touch of the familiarity, if not flippancy, with which he sometimes handled the gravest themes. But he had always the saving graces of humour and common sense.



C. H. SPURGEON.

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Spurzheim, JOHANN GASPAR, phrenologist, was born at Longwich, near Trèves, in Rhenish Prussia, on December 31st, 1776. While studying medicine in Vienna he met Franz Joseph Gall (1758-1828), an able physician, who about 1794 made public his observations on the anatomy and physiology of the brain as the organ of the mind, based upon his comparisons of brain-development with mental development in persons of peculiar capacity or behaviour. Attracted by Gall's theories Spurzheim became his follower. When his lectures were prohibited as being of dangerous tendency they left Austria and started, in 1805, on a tour through Germany, Holland and Switzerland, finally settling in Paris in 1807. Often described as a charlatan, and meeting with both professional opposition and applause, Gall appears to have been a staccato student from boyhood of problems concerning the

functions of the brain. On March 14th, 1808 they presented a memoir of their discoveries to the Institute of France upon which a committee of members, including the eminent Cuvier reported unfavourably. In 1814 Spurzheim went to Vienna to obtain the M.D. degree, then tried Paris without success and came to England where for his propaganda he adopted the name *phrenology* (Greek, "a discourse on the mind") which had been given by Forster in 1815 to the teaching of Gall, hitherto called "craniology," which its author preferred to express as "Functions of the brain." Spurzheim, who was an eloquent speaker, lectured in the chief towns of the United Kingdom and gained an influential convert in 1816 in George Combe, author of *The Constitution of Man*, who wrote *Essays on, and Elements of Phrenology*. From 1817 to 1825 Spurzheim lived in Paris and afterwards returned to England, where he successfully renewed his lectures. In 1832 he went to the United States where, on November 10th of that year, he died suddenly at Boston. He left several works on phrenology and wrote also on the *Elementary Principles of Education* and an *Essay on the Moral and Intellectual Nature of Man*.

Spy, one who in war ventures among the enemy in the guise of a friend or a neutral, or under cover of night, to observe their condition and discover their plans in order to report thereon to his own leaders. If detected, a spy is liable to execution. Spy Wednesday, the Wednesday before Good Friday, was so named in reference to the preparations made by Judas Iscariot on that day to betray Jesus. He had bargained to become the spy of the Jewish Sanhedrim (St. Matthew xxvi., 3-5, 14-16).

Square-Root. If $a^2 = b$, then a is said to be the square-root of b , where b is any expression. For real expressions the method of finding the square-root is a modification of the process of long division, the method used in arithmetic being simply deduced from algebra. If we are dealing with a perfect square, it is of the form $x^2 + 2xy + y^2$, or x^2 and y ($2x + y$), and this forms the basis of the rule by which x and y would be found in turn. The square-roots of expressions containing surds and imaginary quantities are found by special methods. A practical method of finding the square-root of a number is to use logarithms. For since $a^2 = b$, $\log. a^2 = \log. b$, $\therefore 2 \log. a = \log. b$; hence the rule is to look up the logarithm of the number and halve it. The result is the logarithm of the required root.

Squares, METHOD OF. [LEAST SQUARES, METHOD OF.]

Squaring the Circle. [QUADRATURE.]

Squill (*Scilla*), a genus of bulbous-rooted plants belonging to the order Liliaceæ, with a tunicate bulb, linear radical leaves, a racemose scape of blue, white, pink, or purple flowers; a deciduous perianth of six free, or nearly free, segments; epiphyllous stamens, one style, and

a loculicidal capsule. Of the sixty species, twenty of which are European, three are British, namely:—*S. nutans*, the bluebell or wild hyacinth; *S. verna* and *S. autumnalis*. *Urginea Scilla*, formerly known as *Scilla maritima*, a Mediterranean species, separated by its more spreading perianth leaves and more numerous seeds, is the source of the drug known as Squills. Its bulbs are chiefly imported from Malta, those of light colour being the best. They have a bitter or acrid, and even vesicant character, from the presence of a substance known as scillitin. The preparations of this drug contained in the British Pharmacopœia are a tincture, the compound squill pill, the pill of ipecacuanha and squill, and the acetum scillæ. From the last-named are prepared the oxymel scillæ and the syrupus scillæ. The pill of ipecacuanha and squill contains opium in the proportion of 1 part in 23½ parts. The action of squill resembles that of digitalis. It is a cardiac tonic, and produces constriction of the peripheral arterioles, followed by relaxation which is in the first instance marked in the small vessels of the kidney, and squill has thus a diuretic action. Squill is, moreover, a powerful expectorant, and is much employed in chronic bronchitis. It has, however, an irritant effect upon the stomach and intestines, and its administration has to be carefully regulated on this account.

Squint. [STEBISMUS.]

Squirrel, an animal belonging to the Rodent sub-family Sciurinae, with seven genera, universally distributed except in the Australian region. The type-genus *Sciurus* has about seventy-five species, of which only three belong to the Palearctic region. They are arboreal animals, with long, bushy tail, usually carried thrown upwards so as to shade the back; pointed ears, which are generally tufted; with four digits and a rudimentary thumb on the fore limbs, and five digits on the hind limbs, armed with long, sharp, curved claws. The species vary in size from that of a cat to that of a mouse, and attain their greatest size and most brilliant coloration in the tropics. The Common Squirrel (*S. vulgaris*) ranges over the whole Palearctic region. Its total length is about 18 inches, of which the tail counts for nearly half. The fur is reddish brown above (tinged with grey in winter) and white below. It is essentially a wood-dweller, and its diet is almost exclusively vegetable, though it is very fond of birds' eggs, and sometimes eats beetles and grubs. In eating nuts, these are held in the fore paws, which thus take the place of hands, and the strong incisor teeth soon pierce the shell to the kernel, which alone is eaten, for in those kernels that are covered with thick brown skin, every particle of the coating is removed before consumption. When more congenial nourishment is lacking, the creature feeds on buds and young shoots of trees, thus doing a considerable amount of damage and jeopardising its life. It builds

a roofed nest or "drey," in which the young are born. These animals hibernate, taking their winter sleep in holes in trees, having previously laid up a store of provisions to serve them when they wake up, as they do from time to time. [FLYING SQUIRREL.]

Squogging. Every New Year's Day there is witnessed in the New Forest in Hampshire, England, a unique form of hunting known as Squogging. It is engaged in by bands of men and lads of the typical Forester class, each armed with a squoyle. To the uninitiated it may be explained that squog is a squirrel, whilst the squoyle is a handy little club, not unlike a policeman's truncheon and sometimes weighted with lead. It is used as a missile and may thus be said to resemble a knob-kerry. To the Forester the squoyle is very much what the meera, or throwing-stick, is to the Australian native, and the former handles it with a dexterity that would not discredit the blackfellow. Squogging dates from time immemorial, and, so far as is ascertainable, has come down through the ages with absolutely unbroken continuity. Of late years, however, it has shown some signs of going out of fashion, though the day is probably distant when squog and squoyle shall know each other no more for ever. The Forester is a born hunter, as may readily be imagined of the native of a county which, ever since it was laid out by William the Conqueror for the purposes of the chase, has been a region in which deer, fox and otter have given sport to the hounds. Nevertheless, how anyone can find pleasure in hunting to death such a pretty, graceful, inoffensive creature as the squirrel is one of those mysteries that defy solution. And the curious point is that the squirrel is a decided favourite with the Forester. Still, the delights of squogging are irresistible to him, the chief reason therefor being that he is an expert marksman. Invariably his aim is what he calls "There or thereabouts," as the squogs, agile as they are, often find to their cost. Whenever one shows round a trunk or branch a squoyle goes hurtling at it. The sharp little quarry will dodge the weapon if it can and take cover, but too frequently the dreaded squoyle strikes home. The squog-hunters usually are able to show a good bag—more's the pity—at the close of the day's cruel chevyng. The unfortunate victims are then made into pies or baked in moulds of clay, after the style of the gipsies. The flesh is said to afford excellent eating.

Srinagar (that is, the City of the Sun), the capital of Kashmir, in the Western Himalaya, North India, 180 miles N. by E. of Lahore. It is picturesquely situated on both banks of the Jehlam in the Happy Valley, but though about 5,280 feet above the sea, is rendered unhealthy by surrounding swamps. Being almost wholly built of wood, fires are common, and often destructive. It has a famous poplar avenue, 1½ mile long and 56 feet wide. It was planted by Sikhs, is quite straight, and con-

tains 1,714 trees. It has manufactures of attar of roses, carpets, shawls, leather, paper, and silver and copper ware, besides wood-carving and boat-building. Pop. (1901), 122,618.

Staal, MARGUERITE JEANNE CORDIER DELAUNAY, BARONNE DE, woman of letters, was born in Paris on April 30th, 1684. Her father was a painter named Cordier; her mother's name was Delaunay. She was very religiously brought up, and managed to acquire a considerable knowledge of the systems of Descartes and Malebranche. She was left by her mother in poor circumstances, and entered the household of the unamiable Duchesse du Maine. She was mixed up with the politics of her day, and was detained in the Bastille for a couple of years. Her charming manners and high intelligence made her admired by many, including the Baron de Staal, whom she married in 1735, although she did not relinquish her position in the Duchess's household. She died at Gennevilliers, near Paris, on June 15th, 1750. Her *Mémoires*, first published in 1755, and her *Letters* form delightful reading.

Stability is of two kinds, static and kinetic. A body possesses static stability or is in stable equilibrium when, after any slight displacement, it tends to return to its original position. A weight hanging at the end of a string is in this state. We may give it a push in any direction, but it will sooner or later return to its lowest position. Any body is in stable equilibrium when a vertical line through its mass centre falls within the figure obtained by joining the points of support. A three-legged

table may be tilted up and will resume its own place again so long as this vertical line remains within the triangle formed by the three feet. A body possesses instability when any slight displacement causes it completely to change its position. An egg standing on its end is obviously in this condition. Certain bodies may be displaced without afterwards recovering their original position or departing farther from it. These are said to be in neutral equilibrium, and the best example is that of a sphere on a flat surface; the sphere may be moved and will remain wherever it is placed. A body possesses kinetic stability when it tends to remain in a steady state of motion. A hoop remains erect while in motion, and the planets remain in their orbits in virtue of their velocity. A small displacement of either the hoop or planet causes no permanent change in their behaviour; they both maintain a definite average position.

Stadium, a Greek measure of distance, 600 Greek or about 607 English feet long. It was generally applied to the course where foot-races were run at the famous games and elsewhere, the arena, however, not being limited to racing, but utilised for all forms of athletic sports. The most famous stadia were those at Olympia and Athens, which were nearly one-eighth of a mile in length. The stadium was lined on each side and at each end with tiers of seats or sloping banks for the spectators. In the Olympian Games, held at Shepherd's Bush in London in 1908, the various contests took place in the reserved space known as the stadium.

